

QUATREFAGES' NATURALIST'S RAMBLES.

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THE RAMBLES OF A NATURALIST

ON THE

COASTS OF FRANCE, SPAIN, AND SICILY.

By A. DE QUATREFAGES,

MEMBER OF THE INSTITUTE, PROFESSOR OF ETHNOLOGY IN THE MUSEUM OF NATURAL HISTORY, JARDIN DES PLANTES, PARIS, ETC.

Translated, with the Author's Sanction and Co-operation,

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HONORARY MEMBER OF THE LITERARY AND PHILOSOPHICAL SOCIETY OF ST. ANDREWS.

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To Alexander Silver -
with the best wishes of
Arthur D. Moise -

10/6 15512/B

PATHOLOGICAL AND SURGICAL
OBSERVATIONS
ON THE
DISEASES OF THE JOINTS.

BY
SIR BENJAMIN C. BRODIE, BART., V.P.R.S.

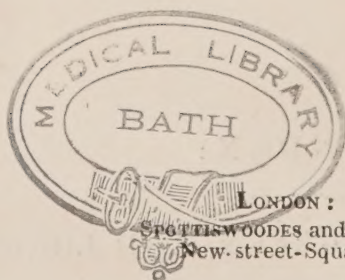
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ETC. ETC.

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ADVERTISEMENT.

THE fifth edition of my Treatise on the Diseases of the Joints, which is now offered to the public, differs, in many respects, from those by which it has been preceded. I have found no reason to alter the general arrangement of these diseases, which my early investigations had led me to adopt. But many new cases and observations have been introduced, illustrating the pathological changes which were described formerly; and some new chapters have been added, relating to other changes, which my earlier experience had led me to notice only in a brief and cursory manner. Those parts which relate to the diagnosis and treatment of diseases have been considerably extended; and I hope that the volume will thus be rendered more useful to the practical surgeon, whose principal object must always be to obtain the means of cure, and to whom scientific pathology will be valuable in proportion as it leads to this ulterior result.

Although these researches have occupied more or less of my time during the greater part of my professional life, I am aware that they are

still imperfect. When I first turned my attention to the subject, I found that I was engaged in a new and extensive field of inquiry, such as it was impossible for one individual, however diligent, and however great his opportunities, thoroughly to explore. Those who follow me will, I doubt not, find much both to add and to correct; but I trust that what I have been able to accomplish will assist them in their labours, and will, in the mean while, in some degree, supply what was formerly a great deficiency in the literature of scientific surgery.

In the earlier editions I published a series of cases illustrative of the history and progress of the various diseases of the joints, as they are exhibited in the living person, and the treatment which they require. I was led to do so, as the subject was at that time, in a great degree, new to my readers, as it had been to myself. Under present circumstances it has appeared to me that another course was to be preferred, and I have accordingly endeavoured to supply the information which it was thus intended to convey in the form of a more complete analysis of the observations which I have made in the course of my practice, omitting the details of individual cases, with the exception of those relating to pathology.

April 22. 1850.

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OBSERVATIONS

ON THE

DISEASES OF THE JOINTS.

INTRODUCTION.

THE following pages contain a series of observations, which were begun many years ago, and which have been continued, not without considerable labour, up to the present period. They relate to a class of diseases which have strong claims on the attention of the surgeon ; since they are of very frequent occurrence ; are a source of serious anxiety to the patients ; and, for the most part, if neglected, proceed to an unfavourable termination. There are other circumstances also, which seem to render the morbid affection of the joints a fit subject of investigation. They have scarcely met with the attention which they merit from former pathologists. The terms, white swellings, scrofulous joints, &c., have been used without any well-defined meaning, and almost indiscriminately ; so that the same name has been frequently applied to dif-

ferent diseases, and the same disease has been distinguished by different appellations. Confusion with respect to diagnosis always gives rise to a corresponding confusion with respect to the employment of remedies; and hence I was induced to hope, that, if it were possible to improve our pathological knowledge of the diseases to which I have alluded, this might lead, not indeed to the discovery of new methods of treatment, but to a more judicious and scientific application of those which are already known, and a consequent improvement of chirurgical practice.

The joints, like the other animal organs, are not of a simple and uniform, but of a various and complicated, structure. Although, in their advanced stages, the diseases, to which they are liable, extend to all the dissimilar parts of which they are composed, it is to be presumed that such is not the case in the beginning. We cannot doubt that here, as elsewhere, the morbid actions commence sometimes in one, and sometimes in another, texture; and that they differ in their nature, and are variously modified, and, of course, require to be differently treated, according to the mechanical organisation, and the vital properties of the part, in which they originate.

It was under the influence of these impressions that I endeavoured to pursue my inquiries into the subject of the present treatise. Believing that nothing has contributed in a greater

degree towards the modern improvements in surgery, than the practice of investigating by dissection the changes of anatomical structure, which disease produces, I availed myself of every opportunity which occurred of making such examinations. In particular, I was anxious to do this where the morbid changes were still in an early stage, and where I had the opportunity of noting the symptoms by which the incipient disease was indicated ; and the knowledge which was thus acquired became the basis of my subsequent observations. In laying the results before the public, I cannot be otherwise than conscious, that these researches are still imperfect. But I feel assured, at the same time, that those who are engaged in the study of pathology, will make due allowance for the difficulties which belong to this most complicated of all the sciences, and will not be disposed to criticise my labours severely, because they find that there is still an ample space left for those who may be willing to engage in similar inquiries.

My earliest observations on the subject of these diseases, were recorded in three papers published in the fourth and two subsequent volumes of the Transactions of the Royal Medical and Chirurgical Society. In the course of the time which has since elapsed, a large surgical practice has enabled me to obtain a more accurate knowledge of their history than I then possessed, and has, at the same time, led me to the employment of more simple and successful methods of

treatment. I have, however, met with no reason for making any essential change in the classification of those affections of the joints which are of most frequent occurrence. Indeed, it has been to me a source of much satisfaction, that all my subsequent experience has tended to confirm the general accuracy of those pathological views which I was led to adopt formerly, and which I ventured to bring forward in the first of those papers to which I have alluded.

CHAPTER I.

INFLAMMATION OF THE SYNOVIAL MEMBRANES OF JOINTS.

SECTION I.

Pathological Observations.

THE soft parts, which, added to the bones and cartilages, constitute the structure of the joints, are: the synovial membranes, by which the lubricating fluid is secreted; the ligaments, by which the bones are connected to each other; and the fatty substance, which occupies what in certain positions would otherwise be empty spaces. It is to be supposed, that the adipose membrane belonging to the joints may be inflamed; that it may be the seat of abscesses and tumours, as well as that which is situated beneath the skin or in the interstices of the muscles; and the ligaments cannot be regarded as more exempt from disease than the fibrous membranes, which they very nearly resemble in their texture. It is not improbable that some of the pains which take place in the joints in rheumatic and syphilitic affections,

may depend on a diseased action occurring in the ligaments; and there can be no doubt that the long-continued symptoms, which occasionally follow a severe sprain, depend on these same parts being in a state of slow inflammation, in consequence of some of their fibres having been ruptured, or over-stretched. I cannot say that I have never seen a case where disease, independently of these causes, has originated in the ligaments; but I certainly have never met with a case where it has been proved to have done so by dissection; and it may be safely asserted, that this is a rare occurrence, and not what happens in the ordinary diseases to which the joints are liable.

On the other hand, no part of the body is much more frequently diseased than the synovial membranes. This is what their anatomical structure and functions might lead us to expect, since we find that living organs are more subject to have their natural functions deranged, in proportion as they are more vascular, and as they are employed in a greater degree in the process of secretion.

The synovial membranes of the joints were not very clearly described by the older anatomists. A sufficiently accurate account of them, however, was published by Dr. William Hunter, in a communication to the Royal Society on the structure of cartilage, published in the forty-second volume of the Philosophical Transactions, and since then they have been described with great accuracy by M. Bichat, in his *Traité des Membranes*;

and to these authors I may refer those of my readers who wish to see their anatomy more fully explained. At present it is sufficient for me to observe, that the office of the synovial membrane of a joint is to secrete the synovia, by which the joint is lubricated; that it lines the ligaments, by which the bones are held together; covers the bones themselves for a small extent, taking the place of the periosteum; and that from thence it passes over the cartilaginous surfaces, and the inter-articular fat. Where it adheres to the bones and soft parts, it very much resembles the peritonæum in its structure, and possesses considerable vascularity; but where it is reflected over the cartilages it is thin, and readily torn: its existence, however, even here, may be always distinctly demonstrated by a careful dissection. The synovial membrane of a joint forms a bag, having no external opening; in this respect resembling the peritonæum, the pleura, and the pericardium; which it also resembles in its functions, and to which it bears some analogy in its diseases.

Cases occasionally (but not often) occur, in which a joint is swollen from a preternatural quantity of fluid collected in its cavity, without pain or inflammation. This may be supposed to arise, either from a diminished action of the absorbents, or an increased action of the secreting vessels. The disease may be compared to the dropsy of the peritonæum or pleura; or more properly, to the hydrocele; and it has been

not improperly designated by the terms "*Hydarthrus*," and "*Hydrops articuli*."

It more frequently happens that there is swelling from fluid in a joint, with inflammation and pain. Here we may presume that the disease consists in an inflammation of the synovial membrane, with a consequent increase of the secretion from its surface; and I have found this opinion to be confirmed by the appearances observed in many such cases, in which I had the opportunity of examining the affected parts after death.

In some instances, while there is still pain and inflammation in the joint, the fluid is felt indistinctly, as if a considerable mass of soft substance lay over it. Often, when the inflammation has subsided, and the fluid is no longer to be felt, the joint remains swollen and stiff; painful, when bent or extended beyond a certain point, and liable to a return of inflammation from slight causes. The appearances observed on dissection, in the following cases, seem to throw light on this subject.

CASE I.

A middle-aged man was admitted into St. George's Hospital in September 1810, on account of a disease in one knee. The joint was swollen and painful, with slight stiffness, and with fluid in its cavity. The swelling extended some way up the anterior part of the thigh, behind the

lower portion of the extensor muscles. It subsided under the use of blisters and liniments. Two months after his admission into the hospital, the patient was seized with a fever, apparently unconnected with the disease in the knee, of which he died. On examining the affected joint, the synovial membrane was found more capacious than natural, so that it extended up the anterior surface of the femur at least an inch and a half higher than under ordinary circumstances. Throughout the whole of its internal surface, except where it covered the cartilages, the membrane was of a dark-red colour; the vessels being as numerous, and as much distended with blood, as those of the tunica conjunctiva of the eye in a violent ophthalmia. At the upper and anterior part of the joint, a thin flake of coagulated lymph of the size of a half-crown piece was found adhering to the inner surface of the synovial membrane. There was no other appearance of disease, except that at the edge of one of the condyles of the femur the cartilage adhered to the bone less firmly than usual.

CASE II.

A. B., a young man, in the spring of the year 1808, in consequence (as he supposed) of exposure to damp and cold, became affected with a painful swelling of one of his knees. Under the treatment employed by the practitioner whom he consulted, the pain and swelling in a great

measure, but not entirely, subsided. Three months after the disease first took place, he was admitted into St. George's Hospital. At this time the knee was swollen, painful, and tender. The swelling had the form of the articulating ends of the bones. The leg was confined to nearly the straight position, and admitted of very little motion on the thigh. His general health was unaffected.

Blood was taken from the knee by cupping; and afterwards it was rubbed daily with mercurial ointment and camphor. The pain and inflammation subsided; and the swelling and stiffness were in some measure lessened. It afterwards became necessary to amputate the limb on account of another disease. The operation was performed on the 15th of December, 1808, and I did not neglect the opportunity of examining the joint.

The bones, cartilages, and ligaments were in a natural state. The synovial membrane was increased in thickness to about one eighth of an inch, and was of a gristly texture. It was closely attached to the surrounding cellular membrane and fascia by means of coagulated lymph, which had been formerly effused on its external surface.

CASE III.

A middle-aged man, who laboured under an organic disease of the liver, was admitted into

St. George's Hospital on the 19th of December, 1821, on account of a painful swelling of one knee. Blood was taken from the part by cupping, and afterwards blisters were applied. The affection of the knee was much relieved under this treatment, but the joint remained rather larger than natural, and somewhat stiff. The disease in the liver continued to make progress, and the man died on the 11th of February, 1822. On examining the body after death, the synovial membrane of the knee was found slightly thickened, and of a gristly structure. The vessels on its inner surface were more loaded with blood than under ordinary circumstances. The cartilage covering that portion of the articulating extremity of the femur which corresponds to the patella, in one spot of about three quarters of an inch in diameter, presented an irregular surface, as if it had been partially absorbed, but not to a sufficient extent to expose the surface of the bone below.

The case which I am about to describe, did not occur under my own observation. The patient was under the care of Dr. Bence Jones, in St. George's Hospital, who has kindly communicated to me the following particulars:—

CASE IV.

January 24. 1850. — A stout healthy-looking servant-maid was admitted into St. George's

Hospital, labouring under a very severe attack of acute rheumatism. She had been ill during the preceding week with pain, swelling, and redness of various joints, and much febrile excitement of the general system. On the tenth day after her admission, apoplectic symptoms suddenly supervened, and she died in the course of a few hours.

Each knee-joint contained rather more than a drachm of turbid glutinous serum. In the upper part of each joint a mass of fibrine (coagulated lymph), about an inch and a half in breadth and the same in length, was found adhering to the surface of the synovial membrane. One of these masses was deeply stained with red blood, but no vessels could be detected in it. On removing them, the synovial membrane which was exposed, was seen to be intensely red and highly vascular, presenting a striking contrast to the white shining cartilage, in which no vessels could be traced, and which was in no wise altered from its natural appearance.

One elbow-joint was examined. It contained a clear synovial fluid, but presented no appearance indicating the existence of inflammation.*

* In addition to the above history, Dr. Bence Jones has furnished me with the following account of the result of a more minute examination of the fluid contained in the knee-joints:—It was alkaline, highly albuminous, containing many oil-globules; many cells, of the size of pus-globules, having well marked nuclei, of a specific gravity greater than that of the albuminous liquid. Some cells were also nearly three

The foregoing cases seem to explain the usual consequences of inflammation of the synovial membrane. It occasions, 1st, a preternatural secretion of synovia; 2dly, effusion of coagulated lymph into the cavity of the joint; 3dly, a thickening of the membrane, a conversion of it into a gristly substance; and an effusion of coagulated lymph, and probably of serum, into the cellular texture by which it is connected to the external parts; 4thly, in some instances adhesion, more or less extensive, of the opposite surfaces of the reflected membrane to each other.

The synovial membranes which form the sheaths of the tendons, and the other bursæ in the neighbourhood, frequently partake of the inflammation of the synovial membrane of a joint. Examples of this complication are very commonly met with in the living person; and I have the notes of a case given to me many years ago by the late Mr. Howship, in which that industrious anatomist found the knee-joint distended with serum, having flakes of coagulated lymph floating in it; the inner surface of the synovial membrane lined by a thin layer of lymph, easily separable from it; and the synovial membranes of the bursæ in the neighbourhood,

times as large as the others, containing granular matter and nuclei. There were no cells in the synovial fluid of the elbow-joint.

also exhibiting marks of inflammation, and distended, like that of the knee, with a turbid serum.

The slight adhesion of the cartilage to the bone, in the first of the cases which have been related, and the partial absorption of it in the last case, must be regarded as the consequence of the greater disease in the synovial membrane, and as analogous to the ulceration of the cornea of the eye which may supervene in a case of severe conjunctival ophthalmia. In cases in which the inflammation has been more intense, or more than usually neglected, or protracted for a very long period of time, still more extensive changes ensue; the synovial membrane losing its natural structure, the cartilages becoming extensively destroyed by a process analogous to that of ulceration of soft parts, and the bones themselves being ultimately rendered carious.

The three following cases will sufficiently illustrate the foregoing observations.

CASE V.

Robert Smith, sixty-four years of age, in the early part of December, 1810, hurt his knee by slipping off a ladder. The accident was followed by pain and swelling of the joint, but not such as to prevent him following his usual occupation. A few days afterwards, in consequence (as it

appeared) of exposure to damp and cold, the pain in the joint became much aggravated. He now became an out-patient of the St. Marylebone Parochial Infirmary. Under the treatment employed the pain and swelling in some degree abated. In the beginning of March, 1811, he was admitted into the Infirmary as an in-patient. By means of the quietude thus obtained, combined with other remedies, his cure seemed to be completed, and in about three or four weeks he left the infirmary as convalescent. On returning to his business however, the inflammation of the joint returned, and continued with repeated exacerbations and remissions until he was re-admitted into the infirmary on the 6th of May. At this time he laboured under the ordinary symptoms of inflammation of the synovial membrane, the joint being much distended with fluid, and the membrane itself apparently thickened. He complained also of a most severe pain, which he referred to the interior of the joint.

The limb was kept in a state of perfect repose, and fomentations and blisters were had recourse to, which relieved the pain, and in a great measure removed the swelling. The patient's general health however, which had been affected for some time, became worse: anasarcous swellings took place in the legs, and he died on the 23rd of July, 1811.

Through the kindness of Mr. C. Phillips, who was at that time surgeon to the infirmary, I had an opportunity of examining the diseased joint.

The parts external to the synovial membrane, including the ligaments of the joint, were in a natural state, except that the synovial membrane closely adhered to them by means of coagulated lymph. The synovial membrane itself was thickened, and there were still some marks of inflammation on its internal surface. In the cavity of the joint there was about an ounce of a reddish-coloured fluid. On the inner condyle of the femur the cartilage had been destroyed by ulceration, on a spot about half an inch in diameter, and a carious surface of bone was exposed. The cartilage on the inside of the head of the tibia was ulcerated to a still greater extent; and the internal semilunar cartilage was in a great measure destroyed by ulceration also. In the space between the two condyles of the femur, on which the patella rests, there was an ulcerated surface of cartilage of about the size of a silver penny; but the whole thickness of the cartilage at this part was not destroyed, and in consequence the surface of the bone was not exposed.

CASE VI.

Robert Aldridge, twenty-nine years of age, was admitted into St. George's Hospital on the 10th of November, 1836, under the care of Mr. Cæsar Hawkins.

The right knee-joint was considerably swollen, the swelling being for the most part composed

of a solid and elastic substance. It was of an irregular shape, being most prominent anteriorly above the patella, and on the inside of the head of the tibia.

There were some superficial ulcerations of the skin covering the knee, and several cicatrices. At the upper part of the knee was an open sinus, into which a probe might be introduced to the depth of two inches, and from which there was a considerable purulent discharge. The joint was stiff, but not so as to prevent some degree of flexion.

The patient complained of pain, which, however, was not much aggravated by the attempts made to bend the limb, and not at all by the pressure of the articulating surfaces against each other.

He said that, six years ago, he had had a severe attack of rheumatism, affecting many of the articulations. Two or three months afterwards, an abscess presented itself, near the upper margin of the patella, which broke and discharged pus, and afterwards healed. Other abscesses formed afterwards, which also healed. Three years ago, he had another attack of rheumatism, also affecting several joints. After some time, the rheumatism again left him, the knee continuing, however, much enlarged.

On the 8th of December, the limb was amputated.

On examining the diseased joint, the synovial membrane was found to have completely lost its

natural structure. It was highly vascular, and much thickened, so that it projected towards the interior of the joint, covering the margin of the articulating surfaces. The cartilages were unaltered, and the bones were free from disease.

The joint contained a sero-purulent fluid. There was a large abscess in the ham, and several smaller abscesses in its neighbourhood, which did not, however, communicate with the articular cavity.

CASE VII.

William Andrews, forty-eight years of age, was admitted into St. George's Hospital, on the 28th of June, 1837.

One knee was considerably enlarged, the leg being fixed at an obtuse angle with the thigh. Pressure on the patella, or the least concussion of the foot, caused great pain in the joint. Otherwise it could not be said that the patient laboured under any disease, though he did not exhibit the appearance of robust health.

He said that, in the course of the last ten years, he had suffered from numerous attacks of rheumatism, in all of which the knee had been more or less affected, and that it had been thus gradually brought into its present condition. He had not been able to leave his bed for six months previous to his being admitted into the hospital.

On the 3rd of August, the limb was amputated.

On dissection of the diseased joint, the inner surface of the synovial membrane was found encrusted with coagulated lymph, thickened and in a pulpy condition.

The greater part of the articular cartilages had disappeared, leaving everywhere a carious surface of bone exposed, which bore marks of considerable vascularity. The portions of cartilage which remained, had only a very slight adhesion to the bone beneath. The inner condyle of the femur and the corresponding part of the tibia, besides being wholly deprived of their cartilaginous coverings, were united by a dense mass of soft substance, resembling that of ordinary adhesions. In other parts there was a considerable quantity of pus, having flakes of lymph floating on it.

Any very extensive destruction of the articular cartilages by ulceration is, I believe, always attended with the formation of abscess in the articular cavity. There is, however, no necessary connection between these two processes. In a patient who recovered in St. George's Hospital, of an attack of inflammation of the synovial membrane of one knee, but who returned to the hospital, and died of another disease, several months afterwards, and in which there never

had been any sign or suspicion of matter being formed, I found, on dissection, that the greater part of the cartilage of the patella, and a small portion of that covering the condyles of the femur, had disappeared, its place being occupied by a thin membranous substance adhering to the bone and forming a distinct cicatrix. I mention this case as being more immediately connected with the subject of the present chapter; but I shall have occasion to advert to other cases which tend to establish the same fact, on a future occasion. Whether the membrane, by which the cartilage is thus replaced, ever assumes ultimately the structure of cartilage, remains to be determined by future observations.

As the cartilage of a joint may be destroyed by a process analogous to that of ulceration of soft parts, without suppuration, so the converse of this may happen; and acute inflammation of a synovial membrane occasionally terminates in suppuration, without any previous ulceration of either the soft or hard textures. Thus, in the case of a patient who died, after having received a punctured wound, which had penetrated into the elbow, I found the joint full of pus, although there was no ulcerated surface. There can be no doubt, that the same thing sometimes occurs, where the inflammation has not had its origin in a mechanical injury. The fact, however, can rarely be actually proved by dissection, as a softening of the cartilages, followed by their complete absorption, is always the

result of the formation of an abscess, under such circumstances, in an articular cavity.

The fluid effused in consequence of inflammation of the synovial membrane, in the slighter cases of the disease, is transparent, differing little from ordinary synovia. In the more severe cases it is a turbid straw-coloured serum, sometimes with, at other times without, flakes of lymph floating in it. In some rare instances, the effused fluid is tinged of a red colour, in consequence of some of the colouring matter of the blood having been secreted with it. In a case related by Mr. Arnott, in his researches on Venous Inflammation, published in the fifteenth volume of the *Medico-Chirurgical Transactions*, it is stated that the cavity of the knee-joint was filled with a "tolerably thick pus, of a uniform reddish colour, as if from an admixture of blood." The following case affords a still more remarkable example of the secretions of an inflamed synovial membrane being tinged in the same manner.

CASE VIII.

Henry Payne, thirty-nine years of age, was admitted into St. George's Hospital, under the care of Mr. Cæsar Hawkins, on the 7th of October, 1829.

He had suffered, formerly, from repeated attacks of rheumatism.

About twelve weeks ago, after exposure to

damp and cold, he was seized with inflammation in nearly all his joints. In the course of a few days, the disease in the other joints had abated; but the right knee became more painful and swollen. At the time of his admission, this knee was tender, painful, and much distended with fluid, and there was a good deal of febrile excitement of the system.

Blood was taken from the neighbourhood of the knee by cupping; and this was followed by the application of blisters. The *vinum colchici*, and afterwards calomel, combined with opium, were administered internally. Under this treatment the pain and swelling of the knee subsided.

On the 27th of October, he was attacked with severe inflammation of the fauces and larynx; which, however, soon yielded to the remedies employed.

On the 31st, he complained of severe pain in the right side, with great difficulty of breathing; and on the 3rd of November he died.

On examining the body after death, both pleuræ were found inflamed, and incrustated with lymph, and serum had been effused into that of the right side. The lungs, also, were inflamed, and some portions of them were in a state of gangrene. The heart was affected with hypertrophy, and the pericardium was inflamed with flakes of lymph adhering to it. The synovial membrane of the right knee contained a dark-coloured fluid; not purulent, but having the appearance of

a thick synovia, tinged with blood. The synovial membrane was everywhere of a red colour, as if stained by this secretion, and the cartilages of the joint had the appearance of having been stained in the same manner. There were some small extravasations of blood in the cellular membrane external to the joint.

SECT. II.

Causes and Symptoms of this Disease.

IT is evident that inflammation may affect the synovial membrane of a joint, by extending to it from some of the other textures of which the joint is composed, or that it may have its origin in the membrane itself. My present observations are intended to relate chiefly to cases of the latter description; and what little is to be said in addition, respecting those of the former, will be better introduced hereafter.

Although no period of life is altogether exempt from this disease, the liability to it is not the same in persons of all ages. It is seldom met with in young children, becomes less rare in those who approach the age of puberty, and in adult persons is perhaps of more frequent occurrence than any other inflammatory affection to which the human system is liable. This is the reverse of what happens with respect to some of the other diseases of joints; and a knowledge of these circumstances will be found to be of some importance to the surgeon, by assisting him to form a ready diagnosis.

Inflammation of a synovial membrane may arise as a local affection, the consequence of a sprain, a contusion, or other mechanical injury.

In other cases, various joints being affected, either simultaneously or in succession, it is manifestly the effect of a disordered state of the general system ; and even in those instances in which the inflammation is confined to a single joint, a careful inquiry will generally satisfy the surgeon that it has had a similar origin. Indeed I must confess that, in proportion as I have acquired a more extended experience in my profession, I have found more and more reason to believe that local diseases, in the strict sense of the term, are comparatively rare. Local causes may operate so as to render one organ more liable to disease than another ; but every thing tends to prove that, in the great majority of cases, there is a morbid condition, either of the circulating fluid, or of the nervous system, antecedent to the manifestation of disease in any particular structure. Moreover, even in those cases in which a disease may be distinctly traced to some kind of mechanical injury, the character which it assumes depends as much on the state of the general health as on the injury itself. Thus we find a sprain of the ankle, in one instance, to be followed by no urgent symptoms, while, in another, a sprain not apparently more severe is followed by intense inflammation, for the removal of which the most active antiphlogistic treatment is required.

The circumstances under which the synovial membranes are liable to become inflamed, are very various. It is only in a limited number of cases that the disease would commonly be ascribed to

gout. Yet I am much mistaken if, among the affluent classes of society, the gouty diathesis be not one of the most frequent causes, not only of inflammation of the synovial membranes, but of inflammation of other organs. There is reason to believe that the real and efficient cause of gout is the presence of an unusual quantity of lithic acid in the blood; and, indeed, the fact has been established by the interesting researches of Dr. Garrod. But local inflammations are not unfrequently preceded by an abundant deposit of lithate of ammonia in the urine, and assuredly no long train of reasoning is required to connect inflammations occurring under these circumstances with the existence of gout in the general system. In such cases, besides the urinary deposit, the disease is generally preceded by flatulence after meals, acidity of the stomach, and other symptoms of disordered digestion.

In other cases, the usual indications of a gouty diathesis are wanting. The disease may be traced to a checked perspiration, consequent on exposure of the person to damp and cold, and here we are justified in classing it with rheumatic, rather than with gouty, affections. If Dr. Prout's speculations as to the predominance of lactic acid in the system being the essential cause of rheumatism, as the predominance of lithic acid is that of gout; and the general opinion be correct that it is the lactic acid in which the secretion of the skin abounds, and which reddens blue litmus paper applied to the perspiring surface, the con-

nection between a checked perspiration and a rheumatic inflammation of the joints is easily explained. It must, however, be acknowledged that, practically, it is not always easy to distinguish a gouty, from a rheumatic, inflammation of a synovial membrane, and that whatever the acid of the perspiration may be, a want of perspiration which causes one individual to be liable to rheumatism, will render another person equally liable to gout.

There can be no doubt that we have yet much to learn as to the pathology of this class of diseases. Not only is it difficult to draw the line between those which belong to gout and those which belong to rheumatism; but it is probable, that under the general term of rheumatism, we frequently confound with each other diseases which have an entirely different origin. Thus, in the early stage of secondary syphilis, in connection with papular eruptions; and sometimes in the advanced stage of syphilis, in connection with chronic affections of the bones and periosteum; it is not uncommon to find the synovial membranes of one or more joints in a state of chronic inflammation. Such a case would not uncommonly be regarded as one of rheumatism, although the real cause of the inflammation is probably the syphilitic virus in the blood. In other cases the joints are similarly affected, in consequence of the system having been saturated with mercury, or in connection with a depressed state of the general health, towards the conclusion of some other chronic malady; and under these circumstances also

it is reasonable to believe that the real and efficient cause of the disease of the joints is not the same as in those of ordinary rheumatism. I shall have occasion to notice hereafter some very remarkable cases of inflammation of the synovial membrane, preceded by purulent inflammation of the urethra and purulent ophthalmia, to which the name of gonorrhœal rheumatism is commonly applied ; though it must be plain to any one who has watched their progress, that the relationship of the disease to rheumatism extends no further than a partial resemblance in the symptoms. The facts seem to be, that there are various morbid conditions of the blood (and, it may be, of the nervous system also), producing a liability to local inflammations, at the same time that the occurrence of the inflammation in one part rather than in another, is to be referred to the agency of local and accidental circumstances. That the synovial membranes should be more frequently the seat of inflammation than the serous membranes to which they bear so great an affinity in their structure, seems to be in no wise remarkable, when we consider that the organs to which they belong, are in a state of constant motion, and that they are, except in a few instances, especially exposed to the influence of the vicissitudes of the external temperature.

The general symptoms which mark the existence of inflammation of the synovial membrane of a joint, may be described as follows :—There is pain in the joint, sometimes referred, in the first

instance, to a particular spot, afterwards to the joint generally. After a period which varies from two or three hours to as many days, according to the intensity of the inflammation, the joint becomes swollen. The swelling, in the first instance, arises altogether from an effusion of fluid into the cavity of the synovial membrane. When the effusion has taken place rapidly and in large quantity, the distension may be so great that the fluctuation of the fluid is scarcely perceptible; but it is, in the early stage of the disease, very distinct otherwise. It becomes less distinct when the inflammation has existed for some time, in consequence of the synovial membrane having become thickened, or from the effusion of lymph on its inner or outer surface; and, in many cases, where the disease has been of long standing, although the joint is much swollen, and symptoms of inflammation still exist, the fluid in its cavity is scarcely to be felt. As the swelling consists more of solid substance, so the natural mobility of the joint is in a greater degree impaired.

The form of the swelling deserves notice. It is not that of the articulating ends of the bones, and, therefore, it differs from the natural form of the joint. The swelling arises chiefly from the distended state of the synovial membrane, and hence its figure depends in great measure on the situation of the ligaments and tendons, which resist it in certain directions, and allow it to take place in others. Thus, when the knee is affected,

the swelling is principally observable on the anterior and lower part of the thigh, under the extensor muscles, where there is only a yielding cellular structure between these muscles and the bone. It is also considerable in the spaces between the ligament of the patella and the lateral ligaments; the fluid collected in the cavity of the joint causing the fatty substance to protrude in these situations, where the resistance of the external parts is less than elsewhere. In the elbow the swelling is principally observable on the posterior part of the arm, above the olecranon, and under the extensor muscles of the fore-arm; and in the ankle it shows itself on each side, in the space between the lateral ligaments, and the tendons which are situated on the anterior part. In like manner, in other joints, the figure of the swelling, whether it arises from fluid alone, or joined with solid substance, depends in a great degree on the ligaments and tendons in the neighbourhood, and on the amount of resistance which they afford; and these circumstances, though apparently trifling, deserve our attention, as they assist us in forming our diagnosis.

In the hip and shoulder the disease occurs less frequently than in the superficial joints: and here the fluctuation of the effused fluid is not perceptible; but the existence of the swelling is sufficiently evident beneath the muscles.

When the shoulder is affected, there is pain accompanied with a general tumefaction of the part; and, in most instances, if the hand be placed

upon it, at the same time that the limb is moved, a crackling sensation is observed, which probably arises from an effusion of fluid into the cells of the neighbouring bursæ. After some time the swelling subsides, or the joint may even appear to be smaller than natural, in consequence of the muscles, especially the deltoid, having become wasted from want of exercise.

When inflammation attacks the synovial membrane of the hip, there is an evident fulness of the groin, and, sometimes, of the nates also. The groin is referred in the first instance to the hip itself, or to the inside of the thigh below the groin, and, in the most advanced stage of the disease, to the knee also.

After inflammation of the synovial membrane has subsided, the fluid is absorbed, and, in the majority of cases, the joint regains its natural size, figure, and mobility. In others it remains more or less stiff, and larger than its natural size. Such enlargement may be the consequence of a merely thickened state of the synovial membrane, and then the swelling has the form of the articulating extremities of the bones. At other times the swelling has the peculiar form which it possessed while the inflammation still existed, and while fluid was contained in the joint; and this is to be attributed, either to an effusion of lymph into the articular cavity, or to an actual alteration of structure of the synovial membrane. The alteration of structure which is here referred to, has been already noticed, and in the following

chapter, I shall have occasion to offer some further observations on the subject. From whichever of these various causes it be that the enlargement of the joint remains after the inflammation has subsided, the patient is very liable to a relapse; so that whenever he is exposed to cold, or the limb is exercised in any unusual degree, and often without any evident cause, the pain returns, and the swelling is augmented.

Although the foregoing observations are applicable to the majority of cases in which this disease exists, they will not be found to contain the whole of what belongs to any one of them; and it remains for me to notice the peculiar circumstances as to which individual cases will be found to differ from each other.

Inflammation of the synovial membranes, like inflammation of other structures, may exist in various degrees of intensity. It may be acute, attended with violent pain and great constitutional disturbance; or it may be chronic, with little local suffering, and without the general system being in any perceptible degree affected by it. We distinguish, therefore, the disease into the acute and chronic. In many cases it has the acute form in the beginning, and assumes the chronic form afterwards; while in others, there being no very urgent symptoms, it may be said to have the chronic form in the first instance.

It must be observed, however, that the boundaries of acute and chronic inflammation do not

admit of being very well defined. These terms accurately enough express the two extremes; but there are numerous intermediate degrees of inflammation, of which it is difficult to determine whether they should be considered as being of the acute or chronic kind. On this, and on many other occasions, the pathologist must be content if he can succeed in pointing out the principal varieties of morbid action which occur, and the symptoms which they produce, in such a manner as will enable others, with the assistance of a certain degree of original observation, to distinguish those nicer shades in the characters of disease, which language is inadequate to explain, but a knowledge of which is of considerable importance in medical and surgical practice.

In some instances, the synovial membranes of two or more joints are inflamed at the same time, or the inflammation leaves one joint to attack another. But it more frequently happens, especially where it presents itself in the chronic form, that the disease is limited to a particular joint. It is worthy of notice, that the knee is more liable to be affected than any other joint in the body.

The pain which the patient suffers, is more or less severe, according to the intensity of the inflammation. But it varies also according to other circumstances. Thus, in some of those cases in which the inflammation seems to be connected with an acute attack of gout (this being indicated by the patient's general habit, by his

liability to acidity of the stomach, and by a deposit of lithate of ammonia by the urine), the pain is often out of all proportion to the other symptoms of inflammation, the patient comparing it to what might be supposed to arise if the joint were compressed by a vice, or if it were violently torn open. The amount of pain depends, also, very much on the structure of the joint in which the disease is situated. The synovial membrane of the hip is much less liable to inflammation than that of the knee; but when it is inflamed, the pain produced is more severe. The synovial membrane of the knee is only partially covered by ligaments; and being itself of a yielding nature, it easily admits of distension, where it is covered by the extensor muscles of the thigh. On the other hand, the synovial membrane of the hip is everywhere, except in one small space, surrounded by, and adhering to, a dense strong capsular ligament, the fibres of which must necessarily offer a painful resistance to the distending force of the fluid, accumulated in the articular cavity.

In cases of inflammation of the synovial membrane of the hip, if active treatment be not had recourse to in the first instance, there is always danger of the head of the femur being thrust outwards beyond the margin of the acetabulum, and then completely dislocated by the action of the muscles. Several cases of this kind of dislocation have fallen under my notice. From these I have selected the two following, as afford-

ing examples of its taking place in two different directions.

CASE IX.

Master L., being at the time about eight years of age, was attacked, towards the end of September, 1824, with what was believed at the time to be inflammation of one of the parotid glands, attended with a good deal of fever. After six or seven days, and apparently in consequence of the application of cold lotions to the cheek, the inflammation left the parotid gland, and attacked one shoulder and arm ; and, at the end of two or three days more, it left the shoulder and attacked one hip. For six or eight weeks he suffered most severely from pain referred to the inside of the thigh, extending from the pubes as low down as within two or three inches of the inner condyle of the femur, and attended with a great deal of fever. There was no pain in the knee. The surgeon, who was then in attendance, applied leeches to the hip, lotions, &c., and afterwards made an issue with caustic behind the great trochanter. The fluctuation of fluid was perceived at the posterior point of the hip, and it was supposed that an abscess had formed. However, no puncture was made, and the fluid gradually became absorbed. In March, 1825, Master L. was sufficiently recovered to be able to walk about, but it was discovered that

the limb was shortened. In November, 1825, I was consulted respecting him. At this time, there were all the marks of a dislocation of the hip upwards and outwards, the head of the thigh-bone being distinctly felt resting on the posterior part of the ilium, above the margin of the acetabulum, and the toes being turned inwards.

CASE X.

Zachariah Price was admitted into St. George's Hospital, on the 18th of July, 1838, labouring under an attack of what seemed to be rheumatic inflammation of the left hip. The hip was slightly swollen, the swelling being most perceptible in the neighbourhood of the great trochanter. A grooved needle having been introduced through the muscles, into the posterior part of the capsule of the joint, some serum escaped by the puncture. The patient complained of much pain when the joint was moved, or when pressure was made on the swollen part; but little or no pain was produced when, the hand being placed on the knee and foot, the head of the femur was pressed into the socket of the acetabulum.

Pills of calomel and opium were exhibited, blisters were applied to the hip, and the limb was kept in a state of complete repose.

On the 27th of October, the limb was found to be in the following condition:—

The form of the hip was considerably altered from what it was at the time of the patient coming to the hospital. The head of the femur could be distinctly felt anterior and internal to the acetabulum. The great trochanter was nearer to the anterior and superior spinous process of the ilium, than that of the other side, by about an inch. The foot was everted, and the limb was an inch shorter than that of the other side. Bending the thigh on the pelvis caused excessive pain, and the limb could not be rotated inwards.

On the 8th of November, a swelling was discovered on the inside of the thigh, near the groin, which, some time afterwards, presented itself, having much the character of an abscess, in the perineum. It was, however, probably, only a collection of serum, as it was gradually absorbed.

March 13. 1839, he left the hospital, being free from pain, and able to walk with a stick, the position of the limb being the same as in October.

It is to be presumed that in such cases the internal ligament of the hip either becomes stretched and attenuated until it at last gives way, or that it is altogether absorbed. In one case which I had reason to believe to have been a dislocation of the same kind, and which I had the opportu-

nity of examining after death, I ascertained that there had been no rupture of the capsular ligament; but that the superior and posterior attachment had gradually shifted its place from the margin of the acetabulum to the dorsum of the ilium above it, so that, although the head of the thigh bone was no longer in the acetabulum, it might be said to be still within the joint. I conclude that the fluid, which in each of these cases was perceptible externally, but was afterwards absorbed, was not pus but serum. This is different from what happens in those cases which I shall have to notice hereafter, in which dislocation of the hip occurs as a consequence of simple ulceration of the cartilages, or of scrofulous disease, originating in a morbid state of the cancellous structure of the bones. In these last-mentioned cases, the formation of abscess is almost an invariable result. The distinction is of great importance in practice. The opening of an abscess of this kind is useful, as it prevents the extension of the mischief among the soft parts of the limb; while the opening of a tumour containing serum, is often productive of the worst consequences, by inducing an extensive suppuration, where there would have been no suppuration otherwise.

The hip is not the only joint in which a displacement of the bones may arise, as a consequence of inflammation of the synovial membrane. When the knee has been for some time distended with fluid, the ligaments being thus extended

and elongated, and the leg having been kept at a right angle to the thigh, the head of the tibia is not unfrequently drawn back by the action of the flexor muscles, and lodged in the popliteal space. The condyles of the femur are then seen, making an unnatural projection in the forepart of the limb, and the leg is ever afterwards incapable of complete extension. In other cases, where, during the existence of the inflammation, the leg has remained in the extended state, such is the relaxed condition of the ligaments afterwards, that the head of the tibia seems to be very loosely connected to the femur, and admits of a free lateral motion on the condyles of the latter.

In some instances, where the synovial membrane has been for some time in a state of inflammation, a peculiar crepitus attends the motion of the joint, which not only may be heard at some distance, but is plainly to be distinguished by the touch. This symptom may be entirely independent of any absorption of the cartilage, as after the inflammation has subsided, the crepitus is no longer perceptible, and it is best explained by attributing it to an alteration in the secretion of the synovial membrane, rendering it unfit for the purposes for which it is designed, of lubricating the articular surfaces.

In other cases, after a long-continued inflammation of the synovial membrane, on examining the knee-joint, a sensation is communicated to the hand as if it contained a number of small

loose bodies, certainly of a different nature from the loose cartilages which are met with in other cases, of which I shall give an account hereafter. I suspect that the substances here referred to, are portions of coagulated lymph, which had been effused from the inner surface of the synovial membrane, and had afterwards become detached, similar to those which are not unfrequently formed in the cavity of an inflamed synovial bursa. I have not, however, had the opportunity of determining the correctness or incorrectness of this opinion by dissection.

I have already mentioned that in some (but certainly rare) instances, inflammation of the synovial membrane proceeds at once to suppuration. In these cases the symptoms are always urgent, the pain very severe, and aggravated by the slightest touch or motion, and there is great constitutional disturbance, indicated by heat of skin, frequency of the pulse, a furred tongue, and probably rigors. The absorption of the cartilages under these circumstances seems to be the consequence, and not the antecedent, of the suppuration.

In a much greater number of cases, the order of events is different, the formation of abscess being preceded by the ulceration of the cartilages. I shall have occasion to offer some further remarks as to the process by which the cartilages are destroyed, in a future Chapter. It is sufficient for me to observe at present, that such an extension of the disease is, for the most part, indicated

by a new and almost intolerable pain in the joint, with painful startings of the limb, preventing sleep; and that, after some time, suppuration follows. The latter, however, as indeed I have formerly stated, is by no means a necessary consequence. I have already mentioned a case in which a distinct and well-formed cicatrix, not at all interfering with the motions of the joint, marked the spot at which the cartilage had disappeared. In other cases, an extensive destruction of the cartilage is followed by complete ankylosis, without any sign of suppuration.

In the labouring classes of society, we meet with many cases in which a chronic inflammation of a joint, especially of the knee, has been neglected during many successive years. Whenever he has had more than usual suffering, the patient has confined himself to the house, or sought relief in an hospital. Having experienced some degree of amendment, without waiting for a cure, he has returned to his accustomed occupations, which he has again been compelled to abandon by a return of his former symptoms. After many of such alternations, the joint after each of them being in a worse state than it was in before, unable to gain his livelihood, suffering from hectic fever, and regarding his limb as an useless incumbrance, he has been glad to obtain such relief as is afforded to him by amputation. Under these circumstances, an abscess very commonly presents itself externally, somewhere in the neighbourhood of the diseased joint;

or otherwise an abscess is discovered on dissection, sometimes occupying the whole of the articular cavity, at other times limited to a portion of it by a mass of imperfectly organised lymph. In such a case, no one of the parts of which the joint is composed, retains its healthy condition. There are no remains at all, or only some imperfect remains, of the cartilages; the bones are ulcerated, their cancelli being exposed, and frequently of a dark, or even of a black colour. There is scarcely a vestige of the original structure of the synovial membrane. These morbid appearances furnish us with no means of determining what was the nature of the disease in its origin, and our diagnosis must be founded altogether on the previous history. Fortunately in this extremity an accurate diagnosis is of no great importance, as it can lead to no essential difference in the surgical treatment of the case.

I have already adverted to a peculiar disease, of which inflammation of the synovial membranes is the principal feature, but in which that inflammation occurs in connection with purulent inflammation of the urethra, and sometimes with purulent ophthalmia. Cases of this kind are not very uncommon, and are now well-known to every

practical surgeon; though it is a remarkable circumstance, that no distinct account of them should have been given (as far as I know) by any pathological or surgical writer, previously to the first edition of the present treatise in the year 1818. The disease is usually described under the name of gonorrhœal rheumatism, though it is plain (as I have already stated) from the course of its symptoms, and from the effects of remedies, that it differs from ordinary rheumatism in many essential circumstances; and though there seems to be no doubt that, while it occurs in most instances as a consequence of gonorrhœa, it may take place quite independently of gonorrhœal infection.

The following case, being one of those which first drew my attention to the subject, will explain the general course and progress of the symptoms.

CASE XI.

A gentleman, forty-five years of age, in the middle of June, 1817, became affected with symptoms resembling those of gonorrhœa. There was a purulent discharge from the urethra, with *ardor urinæ* and chordee. On the 23rd of June, he first experienced some degree of pain in his feet. On the 24th, the pain in the feet was rather

increased, but not in a sufficient degree to prevent his walking four miles. There was some appearance of inflammation of his eyes.

June 25th. — The pain in the feet was more severe; the *tunicæ conjunctivæ* of the eyes were much inflamed, with a profuse discharge of pus.

These symptoms increased in violence, the pulse varying from 80 to 90 in a minute, the tongue being furred and the patient being restless and uncomfortable during the night. The whole of each foot became swollen; there was inflammation of the synovial membranes of the ankles; and it appeared, that the affection of the feet themselves arose from inflammation of the synovial membranes belonging to the joints of the tarsus, metatarsus, and toes. He said that he could compare the pain which he experienced, to nothing else than that which might be supposed to arise from the feet being squeezed in a vice.

On the 27th of June, the left knee became painful; and on the following day, the synovial membrane of this joint was found exceedingly distended with synovia. He was now completely crippled, compelled to keep his bed, and scarcely able to vary his position in the smallest degree without assistance. The inflammation of the eyes and urethra was somewhat abated.

June 30th.—The inflammation of the eyes and urethra had much subsided, and the purulent discharge was diminished. The pains of the joints were less severe; and the feet were less

swollen. On the following day, the knee was less swollen also.

He continued to mend; and on the 10th of July, the swelling of the feet was still further diminished, and that of the knee had almost wholly disappeared. The pulse continued to vary from 80 to 90 in a minute, and the tongue was still furred. He had pain in the feet and knee, but less severe than formerly, and he was restless at night.

July 13th. — He complained of pain in the right knee; and on the following day, there was pain also of the right elbow and shoulder.

The right knee afterwards became swollen from fluid within the cavity of the synovial membrane; but not in the same degree with the other knee, and the swelling soon subsided. There was never any perceptible swelling of the shoulder or elbow.

August 1st. — All the pains were abated. The eye and the urethra were nearly free from inflammation, and the purulent discharge was scarcely perceptible.

August 5th. — He was free from pain, except on motion; the joints which had been affected, were stiff; but he was able to move about on crutches.

From this time he progressively mended. The stiffness of the joints diminished very slowly; but he was free from all uneasiness. He was longer in recovering the use of the shoulder than that of the other joints.

In the following December, at which time he had nearly, but not completely, recovered the use of his limbs, he had another attack of the complaint. The symptoms were the same as formerly, taking place in the same order, and pursuing the same course, but with much less severity. This second attack lasted about six weeks, and left him again considerably crippled.

In March, 1818, he became affected with an ophthalmia of a different nature from that under which he had laboured in the preceding summer. The inflammation was seated in the proper tunics of the eye, and it seemed probable that it would have terminated in adhesions of the iris, and destruction of the power of vision, if the progress of it had not been arrested by repeated blood-lettings and the use of mercury. He had another attack of the same kind of ophthalmia four years afterwards (in 1822).

From this period I have no written notes of the case, though I saw the patient from time to time. He never had any return of the inflammation of the synovial membranes or the purulent ophthalmia, but no year elapsed without an attack of acute iritis. Each attack left the eye with its organisation more impaired than it had been previously. At last the power of vision in one eye was completely destroyed, while that in the other was very imperfect. In the year 1846, the patient was seized with an attack of pleurisy, which terminated his life.

As the subject does not belong to the present

Chapter, I have described the symptoms of this case without adverting to the treatment which was employed. I may, however, briefly mention that leeches and blisters, and liniments and fomentations when the pains were very severe, were the principal topical remedies. The *vinum colchici* was administered internally with some apparent benefit when the synovial membranes were inflamed; and the abstraction of blood from the temples, and the exhibition of mercury, were always employed with the greatest advantage during the attacks of iritis.

I have had the opportunity of seeing many other cases, in which a similar train of symptoms took place.

One gentleman (at the time when these notes were taken) had suffered from as many as nine attacks of this complaint. The first took place when he was under twenty years of age, and the others at various intervals in the course of the next twenty years. In one of them the first symptom was inflammation of the urethra, attended with a discharge of pus, although, from particular circumstances, he could not believe that he had been exposed to the risk of infection. This was followed by purulent ophthalmia, and that by inflammation of the synovial membranes. In three of the attacks, a purulent ophthalmia was the first symptom, which was followed by

inflammation and discharge from the urethra; and then the synovial membranes became affected; and in the other four attacks, the affection of the synovial membranes took place without any preceding inflammation either of the eye or urethra. The disease was not confined to the synovial membranes of the joints, but those of the synovial bursæ were inflamed also. In some of the attacks, the muscles of the abdomen were painful and tender, and subject to spasmodic contractions; and there was an occasional impediment to breathing, which seemed to arise from a similar affection of the diaphragm. The acute form of the disease, in this case, lasted from six weeks to three months; but nearly a year generally elapsed before the use of the limbs was perfectly restored. He had an attack in July, 1817; and in the beginning of May, 1818, while he was still lame, he was seized with a very violent inflammation of the sclerotic coat and iris of one eye, which was subdued by very copious blood-letting and the exhibition of mercury. He had another attack of the disorder in the year 1820, and in the winter of 1822 he became affected with an inflammation of the iris and sclerotic coat of the other eye, which was also relieved by blood-letting and the use of mercury.

Another gentleman gave the following history of his complaints:—In the year 1809, he had symptoms resembling those of gonorrhœa; and, when these had continued for some time, one

testicle became inflamed and swollen. This was followed by a purulent ophthalmia, and inflammation of the synovial membranes. In the year 1814, he had a similar attack, with the exception of the swelled testicle; and in the year 1816, when I was consulted, he still laboured under a chronic inflammation of the synovial membranes of the knees and ankles, the consequence of the last attack, and by which his lower limbs were completely crippled,

In a fourth case, the patient laboured under a severe ophthalmia, which was followed by inflammation of the urethra, and then the joints became affected; but I had no opportunity of watching the progress of this case, nor have I heard any other particulars of it.

In another case, the patient laboured under strictures of the urethra. He had four attacks of the disease which has been just described, in the course of a few years. The inflammation of the urethra was in all of them the first symptom, being followed by purulent ophthalmia, and afterwards by inflammation of the synovial membranes, and swelling of nearly all the joints. In two of these attacks, he attributed the discharge from the urethra to his having received the infection of gonorrhœa; and in the two others, to the use of the bougie.

In the ordinary and less complicated cases of this disease, there is generally an attack of gonorrhœa, having its usual origin, which after a few weeks is followed by inflammation of the sy-

novial membrane of one or more of the articulations. Sometimes the symptoms of gonorrhœa subside before the synovial membranes become affected; at other times, the two orders of symptoms run their course together. In some instances, the disease subsides after the lapse of a few weeks; in others, it is protracted for several months, or even for one or two years. The inflammation is for the most part of that kind which terminates in an effusion of serum, and not of coagulated lymph. But sometimes it is more intense, leaving the synovial membrane thickened, and the joint more or less stiff; and I have known a few instances in which the cartilages became ulcerated, with great pain to the patient at the time, ankylosis being the ultimate result.*

There is a disease which appears to commence with inflammation of the synovial membrane, this being, however, only the first of a series of changes of a peculiar character, which ultimately affect the whole joint, producing a morbid condition of the various structures of which it is

* The etymology of the term ankylosis does not justify the sense in which it is commonly used; but I do not undertake so great a task as that of reforming anatomical and pathological nomenclature. Indeed, the substitution of new terms for those which have been long in use is productive of so much inconvenience, that, except under some peculiar circumstances, it is better that it should be avoided.

composed, wholly different from what is found to exist under any other circumstances. The cases here referred to, are very slow in their process. There is no tendency to suppuration, nor to any thing like the ordinary process of ulceration. In some instances, a deposit of lithate of soda, both within the joint and externally to it, marks the connection of the disease with a gouty habit. In others, the deposit of lithate of ammonia is wanting; but as the changes which occur are in other respects similar, we are justified in regarding the two orders of cases as bearing a near relation to each other. Indeed, judging from the symptoms alone during the patient's lifetime, it can rarely happen that the surgeon will be able to give a positive opinion as to the presence or absence of the gouty concretion. Practitioners generally recognise this disease under the name of *rheumatic gout*; and it must be owned that it has more than a mere imaginary resemblance both to chronic gout and to chronic rheumatism, and such as to justify this appellation.

These observations, however, are here introduced, only because the present Chapter would appear to be incomplete if the subject were left altogether unnoticed. As, both in its symptoms and in its results, the disease essentially differs from the ordinary forms of synovial inflammation, it seems to require a separate consideration, and for this reason I reserve a more extended history of it for a future Chapter.

SECT. III.

Treatment of this Disease.

ALTHOUGH different diseases of joints may require different modes of treatment for their relief, there is one rule which is equally applicable to all of them : — The diseased joint should be kept in a state of absolute and complete repose. Every motion of the bones on each other tends to maintain and aggravate the morbid action, whatever it may be. If this rule be neglected, it will be of little use to have recourse to other remedies ; and if it be observed, it will often happen that some very simple remedies in addition will be all that is wanted for the cure.

In cases of acute inflammation of the synovial membrane of a joint, where swelling rapidly takes place, with severe pain and great external tenderness, the pressure of a bandage (without which no efficient mechanical contrivance for the purpose of restraining the motions of the parts on each other can be employed) cannot be borne. Nor, indeed, under these circumstances, is the interference of the surgeon, for the above-mentioned purpose, much required. The pain which the patient experiences on every movement of the limb, is a sufficient guarantee that he will use

his best endeavours to keep it in a state of repose. These may, however, be assisted by prescribing the maintenance of the recumbent posture, and by laying the affected joint on a water-proof pillow partially distended with air or water, which, by bulging forward on each side, will give sufficient lateral support to counteract, in some degree at least, the ill effects produced by an involuntary starting of the limb.

Whatever difficulty there may be in the application of mechanical means, for the purpose of insuring the repose of a joint which is the seat of acute inflammation, there is no such difficulty where the inflammation has assumed the chronic form. And here, in fact, mechanical aid is more required. In a case of chronic inflammation the motion of the joint may occasion little or no inconvenience at the time, although it invariably tends to aggravate the symptoms afterwards. It is difficult to persuade a patient thus situated to submit to a very rigid system of confinement; and if he should do so, there is always danger, in protracted cases, that his general health will suffer in consequence. It is important that he should not be altogether deprived of the opportunity of taking air and exercise, yet it is necessary that the affected joint should be kept in a state approaching as nearly as possible to one of complete repose. This double object may be attained by means of a proper bandage, applied so as to restrain the motions of the joint, at the same time that it makes no more than a

moderate degree of pressure on it. As to the best mode of carrying this plan into execution, the surgeon must exercise his own judgment in each individual case. Much will depend on the situation of the affected joint. In the case of the knee, elbow, and many other joints, a very convenient method is that of applying a large quantity of calico bandage, with adhesive plaster, in several alternate layers. The principal objection to this plan is that, in the event of any fresh access of inflammation with a sudden increase of swelling, the bandage would become too tight, and cause great suffering to the patient. On this account it should not be drawn very tight, in the first instance; the adhesive plaster should be applied in stripes of moderate length, so that it may nowhere completely surround the limb, and the patient should be instructed as to the mode of removing the bandage himself if that should be required, without waiting for the assistance of the surgeon. The starch-bandage should never be had recourse to, on these occasions. I was called to a lady who laboured under a disease of the knee, and for which a surgeon had surrounded the joint with a long roller imbued with a solution of starch. This at first had given her a not uncomfortable support. But a fresh attack of inflammation having supervened, she began to experience pain, which soon became intolerable. She was unable to remove the bandage herself; and when I saw her, her sufferings were such as can scarcely be expressed

in words. In fact, the joint, if I may use the expression, was trying to swell, and the hard starch bandage acted like a hoop of iron, and prevented the swelling from taking place. It was as if a ligature had been drawn as tight as possible round a whitlow, except that, the part being larger, the pain was in proportion. Of course, I removed the starch bandage, and the violence of the pain abated. It was long, however, before the effects produced by the compression of the joint under these unfortunate circumstances, were wholly removed.

There is a bandage* which is very well suited to cases of this kind, and especially applicable to the knee-joint, composed of a stiff leather in one part of its circumference, and elsewhere of small spiral wires, interposed between two layers of a softer and thinner material, and secured by a lace, so that it admits of being applied with any degree of tightness, and at once loosened, if necessary. In some instances, much support may be wanted, and the leather should be stiff and unyielding. In others, where little support is required, it may be somewhat more pliant. Such a bandage is worn with the greatest comfort, and in the slighter cases it fully answers the intended purpose. As it may be easily removed by the patient's own hands, the use of it is quite compatible with that of the stimulating liniments of which I shall have occasion to speak hereafter.

* The bandage here referred to is made by Schoolbred and Co. in Jermyn Street, London.

But in the more aggravated cases of this disease, where there is an effusion of lymph as well as of serum into the joint, or where the synovial membrane itself is thickened, and still more where there is reason to believe that the disease is affecting the harder textures, these simpler methods of confining the joint will be found to be quite insufficient. The plan which I generally have recourse to, under these circumstances, is that of applying a broad leathern splint* on each side of the limb, or on one side only, according to the joint that is to be supported, the splint, or splints, being secured by a suitable bandage. The splints are made of thick stiff cow-hide, softened in hot (not boiling) vinegar, neatly moulded to the figure of the parts, and allowed to dry on them. These must necessarily give an uniform and complete support, and hence are easy to be worn. They insure the actual immobility of the joint, at the same time that they may at any time be removed and re-adjusted by the patient himself. In ordinary cases, they may be lined with some soft leather, for which oiled silk may be substituted where there is an open abscess or sinus, to prevent the leather being soiled and rendered offensive by the discharge. Similar splints may be made of the gutta-percha; but on the whole I have found those made of the stiff leather to be preferable.

* Splints of this kind are made by Mr. Sparkes, bandage maker, of Conduit Street.

In cases of acute inflammation of the synovial membrane, where the patient is of a strong and plethoric habit, and the symptoms are urgent, it may occasionally be proper to abstract blood from the arm ; but in the greater number of instances it is sufficient to take blood from the neighbourhood of the inflamed joint, by leeches or cupping. This may or may not be repeated, according to circumstances. Warm fomentations are generally more effectual in relieving pain than cold applications. Calomel, followed by an active aperient, may be administered in the first instance, and saline and antimonial medicines afterwards.

Where, from the patient's habit and the character of the symptoms, there is reason to believe that the inflammation is of gouty origin, m xv of the wine of colchicum may be given twice or three times daily, after the bowels have been thoroughly evacuated. This need not be continued for more than four or five days, that time being quite sufficient for the colchicum to have produced whatever advantage is likely to arise from its use. For the most part, indeed, the use of the colchicum, even for so long a period as this, is not required.

Wherever colchicum is administered, it appears to me to be advisable to give some small doses of the *pilula hydrargyri*, or some other preparation of mercury, at the same time, with a view to prevent the former remedy from arresting the secretions of the liver. But there are other cases in which mercury may be given in larger

doses, and for a wholly different object. In this, as in many other instances, mercury exercises a remarkable influence over inflammatory action. To an adult man two or three grains of calomel, with half a grain of opium, may be administered twice, and in urgent cases, three times daily. The object is to place the system as speedily as possible under the mercurial influence. It is seldom necessary to continue the use of it more than a very few days, and it may be left off sooner, or the dose greatly diminished, if the gums become affected by it.

When the knee-joint has been much distended from an effusion of serum into it, and the patient has been suffering severely in consequence, I have sometimes ventured to make punctures with a narrow sharp-pointed instrument, drawing off some of the fluid afterwards by means of an exhausted cupping-glass. I have not known any harm to arise from this practice; but as the relief which it gives is only temporary, and as I cannot be certain, without further experience, that it is always free from risk, I do not much recommend it. The case is different where acute inflammation of the synovial membrane has proceeded rapidly to suppuration, and the joint is distended with pus. Serum effused into a joint will be absorbed as soon as the inflammation which caused the effusion has subsided. But it is doubtful whether pus, once formed, is ever absorbed; and, at all events, the chance of it being absorbed under the circumstances which have

been just mentioned, are so small, that they may be regarded as none at all.

If it be a question whether a collection of fluid in a joint be purulent or otherwise, it is prudent, in the first instance, to make a puncture with a grooved needle. If it prove to be purulent, a free opening should then at once be made with a lancet, in a depending situation. It is important that this operation should not be long delayed, lest the matter should make its way out of the joint in other directions, and form irregular and circuitous sinuses among the neighbouring tendons and muscles. It is equally important that the opening should be sufficiently large to allow the matter to flow spontaneously, without it being necessary to have recourse to pressure on the joint. If afterwards there be reason to believe that there is still a lodgment of matter in any part of the joint or among the neighbouring soft parts, the original opening should be dilated, or the surgeon should avail himself of the first opportunity which occurs, of making another opening in a convenient situation; and it will often happen that several such openings will be required before the cure is completed.

But all this will be of little avail, unless the joint be kept in a state of the most complete immobility. At first, we can do little more than support the limb on a pillow, and endeavour to impress on the patient's mind the necessity of his aiding our views in this respect. Afterwards

we may with great advantage apply some kind of splints, those made of leather being preferable to others. At the same time, great attention should be paid to the state of the general health in all respects; saline medicines, or tonics, or mineral acids, being administered according to circumstances. Of course, care must be taken to prevent costiveness; but on this, as on all other occasions where perfect quietude is required, very active cathartics should be avoided.

Under this treatment we may expect the purulent discharge to lessen by degrees, and at last to cease altogether, as ankylosis becomes established. Before ankylosis is complete, the surgeon should endeavour cautiously and gradually to place the limb in that position which may be most convenient to the patient afterwards: thus, if the elbow be the seat of the disease, it ought, if possible, to be ankylosed in a state of flexion; or, if it be the knee, the leg should be nearly, but not quite, extended on the thigh. It will be sometimes necessary to apply splints of different forms at different periods. Where the knee has been affected, I have frequently employed a wooden splint, consisting of two parts, one adapted to the posterior part of the thigh, the other to the posterior part of the leg, united by a hinge, and furnished with a long screw behind, by means of which the relative position of the leg and thigh may be gradually and cautiously altered.

The foregoing remarks are applicable only to

those cases in which an abscess in the interior of a joint is the immediate consequence of acute inflammation. The management of abscess arising as the ultimate result of a long-continued chronic inflammation, will be considered hereafter. It is scarcely necessary for me to add, that the treatment which is here proposed is also inapplicable to those joints which are clothed by numerous muscles, as the hip and shoulder, in which, in fact, it is impossible to form a positive opinion whether abscess does or does not exist, until it must be too late to make an opening into the joint, even if such an operation could at any period be performed with prudence.

In cases of chronic inflammation of the synovial membranes, local blood-letting may often be had recourse to with advantage, in the first instance. This may be repeated, or not, according to circumstances, and in the intervals compresses may be laid on the part, wet with some cold spirituous lotion. The application of blisters may be useful afterwards, and I have generally found the application of two or three blisters in succession to be preferable to that of a single blister kept open with the savine cerate. The blisters should be of a considerable size; and if the affected joint be deep-seated, they may be applied as near to it as possible; but, otherwise, a blister is frequently of more service when applied

at a little distance. For example, if the synovial membrane of the hip be inflamed, the blister may be placed on the groin or nates ; and if the disease be in the knee, it may be applied to the lower part of the thigh, immediately above the joint. The good effects of this treatment are soon manifest ; and in a few days, the swelling, as far as it depends on fluid collected in the joint, is usually much diminished. Even when the tumour is solid, arising from the effusion of coagulated lymph, it will in a considerable degree subside, and sometimes be entirely dispersed, provided that the lymph has not yet become organised. Blisters are of more service, with respect to the removal of the swelling, than any other applications ; but they should not be employed without the previous abstraction of blood, except when the inflammation is slight, and when fluid is effused without any admixture of solid substance.

After the application of blisters, and in slighter cases in which the use of blisters seems not to be required, stimulating liniments, applied to the skin over the affected joint, will be found useful as counterirritants. One drachm of iodine may be dissolved in $\frac{3}{4}$ j. or 3 x. of rectified spirit, and the whole surface of the joint may be painted once or twice daily with this solution, by means of a large camel's-hair brush, until the skin is tender. It may then be omitted for two or three days, the use of it being resumed afterwards. Various other liniments, however, may be employed with as much advantage as this. One of the most efficient

which I have been in the habit of using, especially in hospital practice, is the following:—

℞. Olei Olivæ ℥ iss.
 Acidi Sulphurici ℥ iss.
 Misce, et adde gradatim
 Olei Terebinthinæ ℥ ss.
 Misce. Fiat linimentum.

It may be made of this strength for the class of persons who apply at an hospital for relief; but for those of a higher grade in society, in whom the cuticle is generally thinner, and the cutis more tender, the proportion of the sulphuric acid should be somewhat less. The effect of this liniment is to excite some degree of inflammation of the skin: the cuticle becomes of a brown colour, and separates in thick broad scales; and the inflammation of the internal parts is relieved, on the same principle as by a blister. Another liniment, which is also very useful, is one frequently recommended, consisting of a drachm (or more) of the *antimonium tartarisatum* mixed with an ounce of the *unguentum cetacei*.* This produces a pustular eruption of the skin, which, like other eruptions of the same kind, runs its course, and, during a certain period of time, operates very beneficially, on the same principle as other counter-irritants, by abstracting blood from the deep-

* There is one objection to the use of the ointment of tartarized antimony which, as far as I know, has not been noticed by writers. It occasionally excites an eruption of small pustules over the body. The eruption is preceded by fever, and the pustules are very similar in appearance to those produced by the local application of the ointment.

seated parts. There are various kinds of stimulating plasters (for example, the *emplastrum ammoniaci cum hydrargyro*) which produce the same effects. There is no objection to the use of them, though it appears to me that the other methods of exciting external irritation are, on the whole, more convenient.

But in cases of chronic, as in those of acute, inflammation of the synovial membranes, it often happens that more depends on the constitutional treatment than on any local remedies.

The patient may have a furred tongue, with costive bowels, and other marks of derangement of his digestive organs, and may derive benefit from the exhibition of alterative doses of the *pilula hydrargyri*, with a draught of compound decoction of aloes and infusion of senna administered every morning, or a more active aperient occasionally. He may be flatulent after his meals, suffering from acidity of the stomach, with a red or yellow deposit in his urine, and alterative doses of the acetic extract of colchicum may be added to the mercurial pill. In cases in which the disease may be traced either to gout or rheumatism, the Iodide of potassium is frequently very useful. Two or three grains administered twice daily will be sufficient, but in these doses the use of the remedy may be continued for some weeks. The *liquor potassæ* may be added to it with advantage, in some cases of dyspeptic persons; and those who complain of being lowered or depressed by the use of the Iodide alone, will find those ill effects counteracted by substituting

the sesquicarbonate, or some other preparation of ammonia, for the other alkalies.

Where inflammation of the synovial membrane occurs in conjunction with the early symptoms of secondary syphilis, it generally yields to the use of mercury. In the more advanced stage of syphilis, sarsaparilla may be given, either alone or in conjunction with mercury, or the iodide of potassium. Sarsaparilla, and whatever tends to the improvement of the general health, may be had recourse to, where the disease is the result of the incautious use of mercury, or where in consequence of some peculiarity of constitution, mercury has disagreed with the patient.

Where the disease occurs in individuals, whose bodily powers are exhausted by over-exertion, or long previous illness, and is to be regarded as a symptom of general debility, the patient may derive benefit from sea air, the use of warm sea-baths, and from various tonics, such as the sulphate of quinine, the citrate of quinine and iron, or the decoction of cinchona, the latter being exhibited alone, or in conjunction with guaiacum, and combined with a generous but prudent diet. In short, the same rule applies to these as to all other cases of local disease. If any of the animal functions be in any way deranged, the surgeon should endeavour, by suitable remedies, to restore them to a healthy condition.

Of the diseases which are not actually hopeless and incurable, few are more intractable than that peculiar inflammation of the synovial membrane,

which occurs in conjunction with purulent inflammation of the urethra, and sometimes with purulent ophthalmia. In these cases, and in the commencement of the attack, I have generally found the most advantage to be derived from the exhibition of saline medicines, combined with the wine of colchicum, and occasional aperients; leeches, cupping, and blisters, being at the same time had recourse to, according to circumstances. In a more advanced stage of the disease, I believe that the iodide of potassium is sometimes useful. In the great majority of cases, however, it seems to me that the disease must run its course, and that all that can be done, either by the surgeon or the patient, is to guard against the operation of those causes which might tend to aggravate or renew the symptoms. Irregularities as to diet, and a careless mode of life otherwise; and exposure to damp and cold, are especially to be avoided.

I have known some cases in which the patient after having derived little or no advantage from various methods of treatment in our damp climate, has obtained very great benefit, and indeed a perfect cure, from a residence in the south of Europe; and I have no doubt that for any one who is thus afflicted, and whose circumstances enable him to do so, it is worth while to have recourse to this experiment. One gentleman, who has suffered from this disease in an unusual degree, recovered in Italy, and after being there for several months returned to England. Immediately on his return, however, there was a

recurrence of his former symptoms, which again subsided on his going back to Italy.

In ordinary cases, after the inflammation of the synovial membrane has subsided, a joint is sustained so nearly in its natural condition, that no further treatment is required. But it is not so in all cases.

1. I have already observed that where the distension, from the effusion of fluid into the joint, has been very great, not only the synovial membrane, but the ligaments also are left so extended and relaxed, that the bones are preternaturally moveable on each other. Under these circumstances it will be necessary for the patient to wear a bandage, until sufficient time has elapsed for the ligaments to be restored to their natural condition.

2. Where the disease has terminated in the absorption of the cartilages and ankylosis, it is to be borne in mind that the union of the bones is only by soft substance in the first instance, and to prevent any injury accruing from accidental violence, leather splints should be worn until there is reason to believe that the bony union is complete. While the process of union is going on, it is important that the surgeon should endeavour to place the limb in that position which will be most convenient to the patient afterwards. I have adverted to this subject be-

fore, but it is a matter of so much importance that no excuse is necessary for repeating the observation. A fore-arm in a state of permanent flexion is still a very useful limb, while it is comparatively useless if it be permanently extended. A leg bent at an acute, or even at a right angle to the thigh, is an actual incumbrance, and I have known a patient to submit to amputation on this account; whereas if the leg be ankylosed in the same line with the thigh, the inconvenience is really trifling. I was consulted at the same time by two individuals, in each of whom there was ankylosis of the hip joint. In one of them the femur was fixed at a right angle to the pelvis, while in the other it was fixed in the line of the trunk. The latter walked with a moderate limp and suffered little inconvenience, while the former could not walk, except with crutches, and complained that his leg and thigh were always in his way.

3. When the joint is left not ankylosed, but limited, as to motion, in consequence of a thickened state of the synovial membrane, with or without adhesions in the neighbourhood, with a view to the restoration of its mobility, friction may be employed, as I believe, with some advantage. For this purpose it is best to employ a professional rubber, the friction being made with the hand, having in it some powdered starch, for half an hour, or an hour, or two or three hours daily, according to circumstances; or shampooing, which is another mode of friction, may

be had recourse to, combined with the vapour bath. All kinds of friction, however, are to be used with caution, as if resorted to at a too early period, or carried to a great extent, they will not fail to cause a recurrence of inflammation. Nor are these methods of expediting the cure to be regarded as actually necessary. In fact, the mere exercise of the joint for the common purposes of life, answers the purpose of friction, and it is a question whether, in many instances, friction and shampooing have not obtained the credit which really belongs to a less artificial mode of treatment.

Friction may be used for another purpose, with perfect safety and with much advantage. Where a joint has been long diseased, the muscles of the limb become weak and wasted, from want of use. One of the first symptoms of the patient's amendment is, that he complains of weakness, which, while the disease was going on, he had not discovered. Friction of the muscles has in some degree the same effect as exercise, causing more blood to flow into them, and increasing their bulk and power of action, and thus enabling the patient to regain the use of the limb sooner than he would regain it otherwise.

I have already described what I believe to be the proper mode of treatment to be pursued, where acute inflammation of the synovial mem-

brane has proceeded rapidly to suppuration. In the majority of such cases, with due attention on the part of both the surgeon and the patient, the limb may be preserved. It is far otherwise when an abscess in a joint is the result of a long-continued and neglected chronic inflammation. Here, not only all the soft parts are in a state of extensive disorganisation, but the disease has affected to a greater or less extent the cancellous structure of the bones. I do not say that a joint under such circumstances, by means of support from splints, and attention to the general health, can never be preserved, but I believe that the cases of recovery form a rare exception to the general rule; and, that for the most part, the principal thing for the surgeon to consider is, whether there be or be not any objection, on account of the state of the patient's general health, or otherwise, to the removal of the limb by amputation.

CHAP. II.

ULCERATION OF THE SYNOVIAL MEMBRANE.

THE three following cases present some peculiarities, which lead me to regard them not only as worthy of being recorded, but as deserving a separate place in this volume. The most remarkable circumstances belonging to them are the occurrence of ulceration of the synovial membrane, at so early a period that it is a question whether this was not the primary disease; and the very urgent symptoms which arose from the sympathy of the general system with the local malady.

CASE XII.

A young lady, nine years of age, being at play, on the 1st of January, 1808, fell and wrenched her hip. She experienced so little uneasiness, that she walked out on that day as usual. In the evening she went to a dance, but while there was seized with a rigour; was carried home and put to bed. Next morning she was much indisposed, and complained of pain in the thigh and knee. On the following day she had pain in the

hip, and was very feverish. These symptoms continued; she became delirious; and she died at the end of a week from the time of the accident.

On inspecting the body on the following day, the viscera of the thorax and abdomen were found in a perfectly healthy state. The hip-joint, on the side of the injury, contained about half an ounce of dark-coloured pus; and the synovial membrane, where it was reflected over the neck of the femur, was destroyed by ulceration, for about the extent of a shilling.

CASE XIII.

A middle-aged man, who had met with a contusion of one shoulder, was admitted into St. George's Hospital in the winter of 1812. He complained of pain and tenderness of the shoulder, and a very slight degree of swelling was observable: but his principal disease was a fever, resembling typhus in its character, of which he died in a few days after his admission.

On inspecting the body, about half an ounce of thin pus was found in the shoulder-joint. The synovial membrane bore marks of general inflammation; and in one spot, where it was reflected over the neck of the os brachii, it was destroyed by ulceration for about the extent of a sixpence.

CASE XIV.

Master F., about ten years of age, awoke on the morning of the 18th of December, 1839, complaining of pain in the region of one hip. By the middle of the day the pain had increased, so that he had great difficulty in moving the limb. He was directed by his medical attendant, Mr. Lucas, to remain in the recumbent posture, and to take some aperient medicine. He had a sleepless night, and on the following morning his pulse was about 100 in a minute; his countenance was flushed; and he experienced intense pain, referred to the *os ilium* and the groin. Mr. Lucas prescribed the application of leeches, pills of calomel and opium, and a saline medicine, with antimonial wine. In the course of the two following days the leeches were repeated. On the 23d of December, by Mr. Lucas's desire, I was consulted. At this time the pain was intense, aggravated on any attempt to move the limb; and there was great general disturbance of the system. I recommended that the same plan of treatment should be continued. The symptoms, however, were not relieved. I saw him again on the 28th of December, when there were symptoms similar to those which indicate an effusion of fluid in the ventricles of the brain; that is, moaning, stupor, and dilated pupils. On the evening of that day he died.

The body was examined by Mr. Lucas, to

whom I am indebted for the following account of the morbid appearances.

The cavity of the hip-joint was filled with pus ; and, before it was opened into, pus might be seen escaping from it, apparently through small ulcerated openings in the capsular ligament and synovial membrane.

The internal surface of the synovial membrane was ulcerated in several places. The internal or round ligament was destroyed by ulceration at the extremity connected with the acetabulum, while that part of it which was connected with the head of the femur remained entire.

The cartilage at the upper part of the acetabulum was destroyed by ulceration, but only to a small extent. There were some small superficial ulcerations of the cartilage covering the head of the femur, giving it an uneven surface, but not penetrating through its substance.

CHAP. III.

ON CASES IN WHICH THE SYNOVIAL MEMBRANE
HAS UNDERGONE A MORBID CHANGE OF
STRUCTURE.

IN one of the cases formerly described, it has been stated that "the synovial membrane had completely lost its natural structure, being highly vascular, and much thickened, so that it projected into the articular cavity covering the margin of the cartilaginous surface."

Such alterations in the condition of the synovial membrane are not very uncommon in cases of chronic inflammation, neglected and protracted, as it often is, for a series of years.

CASE XV.

IN a diseased knee, which was sent to me for examination by my friend the late Mr. Horn, surgeon to the Newcastle Infirmary, I found, in the cavity of the joint, about four ounces of a pale yellow fluid, having flakes of coagulated lymph floating in it. The synovial membrane, where it formed the loose folds, extending from

one bone to the other; where it was reflected over the bones themselves, the crucial ligaments, and the fatty substance of the joint, had completely lost its natural appearance. It was converted into a pulpy substance; in most parts about a quarter, but in some parts nearly half an inch, in thickness, of a light-brown colour, intersected by white membranous lines, and with red spots formed by small vessels injected with their own blood. The synovial membrane on the edge of the cartilaginous surfaces had undergone a similar change of structure, but only for a small extent. The semilunar cartilages were entire, but in a great measure concealed by the pulpy substance projecting over them. The cartilages covering the bones, in a few places, were in a state of incipient ulceration.

CASE XVI.

James Gould, sixty-five years of age, was admitted into St. George's Hospital in May, 1834. One knee was swollen and stiff, admitting of scarcely any motion. The swelling was elastic. He complained of severe pain in the joint. Near the ligament of the patella was the orifice of a sinus, which discharged a very small quantity of pus. No clear history could be procured of the disease in its earliest stage, except that the joint had been the seat of repeated attacks of inflammation of the synovial membrane.

The limb was amputated on the 23d of May.

On dissection, the ligaments, bones, cartilages, and the layer of the synovial membrane reflected over the cartilages, were found to be in a natural state; but the synovial membrane in other parts was preternaturally vascular, and much thickened, having undergone the same morbid change as in the case last mentioned.

In other cases the synovial membrane undergoes changes which are still more remarkable. Not only does it, as in the preceding cases, lose altogether its membranous character, but vascular fringes project from it into the cavity of the joint, which, in a more advanced stage of the disease, become converted into a number of membranous processes, containing a fatty matter, and a good deal resembling, not only in appearance but in structure, the *appendices epiploicæ* of the great intestine.

CASE XVII.

George Ainsworth was admitted into St. George's Hospital, under the care of Mr. Keate, on the 8th of June, 1840, having laboured under what was considered to be a rheumatic disease of one knee during the preceding eighteen months.

The joint was painful and much enlarged, and

the size of it was not much reduced under the use of the remedies employed.

On the 16th of September, he left the hospital of his accord; but shortly afterwards he was re-admitted, under the care of Dr. Hope, on account of a pulmonary disease, of which he died.

On examining the body, numerous masses of effused blood, from the size of a pea to that of a hazel-nut, were found in both lungs, the intermediate tissues being apparently in a healthy state.

The synovial membrane of the diseased knee was connected into a thick mass of organised substance, which presented a peculiar flocculent appearance on its inner surface. The parts are preserved in the Museum of St. George's Hospital.

I shall hereafter describe the case of a woman, who died in St. George's Hospital of another disease, having, during a very long period of time, laboured under what was considered as a chronic rheumatic affection of various joints, but especially of the knees; and in whom, the synovial membranes of these joints, besides being much thickened and preternaturally vascular, presented on their inner surface the appearance of a great number of excrescences, such as I have already mentioned as resembling the *appendices epiploicæ* of the great intestine, smooth and membranous externally, and inter-

nally composed of condensed cellular membrane and fat.

That this morbid condition of the synovial membrane was to be regarded as the effect of long-continued inflammation, there can be no doubt. In the Museum of St. George's Hospital there is a preparation of a knee-joint, the synovial membrane of which is affected in the same manner, the only difference being that the excrescences are more numerous and more distinctly marked. I conclude that the disease had the same origin; but I purchased the preparation at the sale of the late Mr. Heaviside's museum; and nothing is known of the history of the case.

Although in the great majority of instances in which the synovial membrane of a joint has undergone a morbid alteration of structure, that alteration has been the consequence of long-continued and neglected inflammation, we are not, therefore, justified in the conclusion, that in all cases in which the synovial membrane is thus affected, the disease is to be traced to the same source. At all events, there is no reason why in this, as in other parts of the body, a change of this kind should not take place from other causes, and independently of any antecedent inflammatory action. The following cases may throw some light on this in-

quary, which is one of considerable interest both to the pathologist and to the practical surgeon.

CASE XVIII.

Martha Manners, twenty-six years of age, was admitted into St. George's Hospital on the 6th of March, 1813, on account of a disease in her right knee.

She said that in June, 1811, she first observed the joint to be swollen and stiff; and from this time the swelling and stiffness increased; but, in the first instance, by very slow degrees. About Michaelmas, 1812, she caught cold, and the swelling increased more rapidly; but it was not attended with any considerable degree of pain.

At the time of her admission into the hospital, the right knee measured about two inches in circumference more than the left. The swelling was elastic; prominent at the upper and lower part of the joint; not having the form of the articulating ends of the bones. The joint admitted of motion, but the leg could not be completely bent or extended on the thigh.

Various remedies were employed without the smallest benefit. The stiffness of the joint increased. About the middle of May, she began to experience considerable pain; and soon afterwards an abscess presented itself by the side of the ligament of the patella, which was opened on the 15th of June. The orifice made by the

lancet healed in a few days ; but she continued to suffer severe pain ; her health became much affected, and on the 6th of August the limb was removed by amputation.

On examining the joint, about an ounce of thick pus was found in its cavity. The ligaments were in a natural state. The synovial membrane, where it extended from one bone to the other, was converted into a brown pulpy soft mass, of considerable thickness, intersected by membranous lines. The whole of the thin layer of the synovial membrane covering the cartilages had undergone a similar change, the only difference being that here it was of much less thickness than elsewhere.* The cartilages had begun to ulcerate in a few spots, but the ulceration had made so little progress, that it might have been overlooked by a careless observer.

* As I stated formerly, Bichat has considered the membrane by which the cartilages are invested as a continuation of the synovial membrane. This view of the matter has been controverted by some modern anatomists. The dispute is in great measure verbal, as no one doubts that there is a thin membrane expanded over the cartilages, which begins at the margin, where the synovial membrane terminates. In the case above described, as well as in that which follows, the membrane covering the cartilage partook of the disease which affected the membrane lining the ligaments, and passing from one bone to the other ; and this fact seems to justify the application of the same name to both structures. On this subject the reader may refer to Mr. Toynbee's Paper in the 3rd Number of the London Journal of Medicine, March, 1849.

CASE XIX.

John Dillmore, thirteen years of age, was admitted into St. George's Hospital in the summer of 1812, on account of a disease of one knee.

The joint was slightly swollen, and stiff, so as to admit of only a limited degree of motion. He was free from pain. The swelling was elastic, and there was no perceptible fluctuation of fluid. These symptoms had been coming on gradually for two years previous to his admission. At this time he remained in the hospital for upwards of three months, and a great number of remedies, which it is unnecessary to enumerate, were employed without the smallest advantage.

On the 26th of January, 1814, he was readmitted into the hospital. The affected knee was now two inches and a half in circumference more than the other. The swelling was elastic; it extended up the anterior and lower part of the thigh, as in cases of inflamed synovial membrane, but its form was less regular, being more prominent, and extending higher up on the outside, than on the inside of the limb. The leg was kept in the half-bent position, and was perfectly immoveable on the thigh. The patient was subject to occasional attacks of violent pain. He said that the swelling had gradually increased from the period of his quitting the hospital in 1812, but that he had not been subject to any severe

pain until about six weeks previous to his re-admission. On the 31st of January the limb was amputated.

On examining the diseased joint, the synovial membrane was found converted into a pulpy substance of a light brown colour, with red spots, arising from vessels ramifying in it, injected with their own blood, and it was intersected by very numerous membranous lines. On the outside of the joint, the diseased membrane was in some places nearly an inch in thickness. The membrane covering the cartilages in some parts was in a natural state; in other parts, it had undergone the same morbid change of structure as elsewhere. The cartilages were ulcerated in spots. There was about half an ounce of pus in the cavity of the joint; and there were two or three abscesses in the substance of the synovial membrane, not communicating with the joint, containing in all about the same quantity of purulent matter.

CASE XX.

William Hine, twenty-three years of age, was admitted into St. George's Hospital on the 12th of December, 1814, on account of a disease in one of his knees. He said that, in the summer of 1812, he first observed a slight degree of stiffness and swelling of the joint, unattended by pain. At first the swelling was confined to the

inside, but it gradually extended itself over the whole circumference of the joint. The stiffness and swelling slowly, but uniformly, increased, and about the end of the year 1813, he began to experience considerable pain.

At the time of his admission, the knee was much swollen; the swelling was irregular, and most prominent on the inside; it was soft and elastic, without the fluctuation of fluid. The patient complained of constant, deep-seated, gnawing pain, which disturbed his sleep. He had a slight degree of hectic fever. On the 16th of December the limb was amputated.

On dissecting the amputated joint, the synovial membrane was found to have undergone the same morbid alteration of structure as in the last case. The cartilages were slightly ulcerated in a few spots.

I have notes of some other cases which do not essentially differ from those which have been just related. It is to be observed, that in the commencement there was neither pain, nor tenderness, nor other signs of inflammation present; that the enlargement of the joint began almost imperceptibly, and that it increased steadily and gradually; that until the disease had reached a very advanced stage, stiffness of the joint and swelling were its characteristic symptoms, with little or no pain, even when the limb was moved;

and all these circumstances seem to warrant the conclusion that the disease was no more inflammatory in its origin than morbid alterations of structure, and morbid growths generally, are in other organs. Nor is this opinion contradicted by the fact of inflammation, with abscess and ulceration of the neighbouring textures, occurring ultimately, this being analogous to what happens in cases of tubercles of the lungs, scirrhus of the breast, and even in so simple and innocent a disease as the common adipose tumour.

It is evident from the history of cases in which a part of the living body has assumed a new and morbid structure, that this alteration seldom takes place except by slow degrees; and it would add much to the interest and utility of researches in morbid anatomy if it were more frequently attempted to ascertain, what is the first change in the organisation of the affected part which such a disease produces, and from thence to trace the gradual progress of the other changes which take place, until the destruction of the natural organisation is completed. Whether the following case is to be considered as of the same kind as those last described, but in an earlier stage of the disease cannot at present be determined: at all events, it seems worthy of being recorded; and I venture to introduce it in this place, in the expectation that it may at any rate be of

some service in assisting the labours of future inquirers.

CASE XXI.

— Belton, a boy eleven years of age, was admitted into St. George's Hospital, in August, 1810, on account of a disease in one knee.

There was but little pain in the joint: it was slightly enlarged, admitted of some motion, but not of complete flexion and extension. His parents said that the disease had begun about a year and a half before his admission into the hospital; that it had increased very slowly; and that he had never suffered from it any serious distress. Various remedies were employed without benefit; and in a short time his friends took him out of the hospital. A few weeks afterwards he died, in consequence of an accumulation of water in the ventricles of the brain.

Having the opportunity of examining the body, I found that the synovial membrane of the affected knee externally had its natural appearance. Internally it was lined by a straw-coloured gelatinous substance, so intimately adhering to it, that it could not be detached, except by an artificial separation. The synovial membrane was encrusted in this manner every where except on the cartilaginous surfaces. The gelatinous substance in general appeared to be about one-eighth of an inch in thickness, but in some parts near

the margin of the cartilage it was much thicker, so as to project considerably into the cavity of the joint. In a few places, towards the edge of the articulating surfaces, the cartilage had begun to ulcerate. In some of these it was entirely absorbed, so that the bone was exposed; but for the most part there was only an irregular ulceration on the surface, the remaining portion of the cartilage being entire, and retaining its natural adhesion to the bone.

The synovial membrane itself bore no marks of inflammation. In the substance with which it was lined some vessels were observed ramifying, injected with their own blood; but these were few in number, and only in certain parts. This substance differed from the coagulated lymph which is found on the surface of an inflamed membrane; and we may presume, considering the circumstances, that it was the result, not of inflammation, but of some other morbid action.

SECT. II.

Diagnosis and Treatment of these Cases.

WHEN the synovial membrane of a joint has been the seat of long-continued and neglected inflammation, we may conclude that it has become in a greater or less degree altered in structure; but it is only in the more advanced stage of such disorganisation that its existence can be distinctly recognised. It is then indicated by the swelling being of a less regular shape than formerly (being more prominent in some parts, less so in others), and by its being formed chiefly of an elastic solid substance, under which the fluctuation of fluid is for the most part only just perceptible.

The analogy of what happens in the case of the inflamed and granulated *conjunctiva* consequent on conjunctival ophthalmia, seems to justify the opinion that, when the change in its condition exists only in a limited degree, the synovial membrane may, under a proper mode of treatment, persevered in for a considerable length of time, be restored to a healthy state. But it would be unreasonable to expect this favourable result in the more advanced stage of the disease. Under these circumstances, the questions will arise,— Is the joint altogether in a hopeless con-

dition? Can the limb be preserved; or must the patient sacrifice it in order that he may save his life?

If the local symptoms, or the hectic state of the general system, indicate that the diseased state of the synovial membrane is complicated with abscess in the joint, the removal of the limb by amputation is, in the very great majority of cases, the most prudent and safest course. But if this complication does not exist, I am inclined to believe that the limb, though not the joint, may often be preserved. In an ankylosed joint, the synovial membrane gradually wastes away, and at last wholly disappears. Under the circumstances which have been just described, let the bones of which the joint is composed, be kept in a state of complete and absolute repose, by means of well-made and convenient splints, and let this system be continued until ankylosis has taken place. By degrees, the synovial membrane will become less tumid; and at last, the joint being reduced to even less than its natural size, we may presume that it has been altogether absorbed. I am much mistaken if I have not known this actually to happen. But such a result is not to be obtained without care and perseverance on the part of the surgeon and his patient, and confidence on the part of the patient's friends, whose very natural impatience forms one of the principal difficulties in the way of a cure of all the more tedious and obscure forms of curable disease.

I have already adverted to the principal circumstances on which our diagnosis is to be founded in those cases in which a morbid alteration in the structure of the synovial membrane, bearing a considerable resemblance to that which is the consequence of inflammation, takes place without inflammation having preceded it. They may be thus briefly recapitulated:—

1. A sense of stiffness, and a tumefaction beginning, almost imperceptibly, and then slowly and gradually increasing.

2. An absence of pain, even on the joint being moved, and of the other signs of inflammation, until the most advanced stage of the disease, when the cartilages begin to ulcerate, and abscesses form, either in the joint itself, or in the substance of the swollen membrane.

3. Ultimately, a very considerable enlargement of the joint, generally of an irregular shape, formed by a mass of solid but elastic substance, without any distinct fluctuation of fluid.

This disease evidently is one of the more simple kinds of morbid growth. It is altogether local, contaminating neither the lymphatic glands nor the general system. After having been removed by amputation, I have no reason to believe that it is liable to reappear, either in the limb itself or elsewhere.

I formerly had been led to regard the disease as one which does not admit of a cure; and I still see no reason to doubt the correctness of this opinion respecting it in its more advanced stage. My

later experience, however, leads me to think more favourably of it, if it be attended to at an earlier period. The following history will sufficiently explain the treatment which may be had recourse to with advantage.

CASE XXII.

Mr. W., eighteen years of age, consulted me on the 1st of April, 1835.

The right knee was much enlarged: it admitted of very limited motion. The swelling was soft and elastic, more prominent in some parts than in others. The patient did not complain, except of a slight aching occasionally, produced by exercise. He said that the swelling and stiffness began almost imperceptibly five years ago, and had increased uniformly and gradually up to the time of my being consulted. The general health was unimpaired.

The joint was supported by alternate layers of calico bandage and adhesive plaster, so as to make an uniform and moderate pressure on it, and at the same time limit its motion. In addition to the local treatment, a course of sarsaparilla was prescribed, with small doses of the bichloride of mercury. This medicine was taken for about eight weeks.

On the 29th of February, 1836, I prescribed two grains and a half of the iodide of potassium, to be taken three times daily.

Under this plan of treatment the knee became much reduced in size. On the 23d of April following, a pair of leathern splints, supported by a bandage, was substituted for the plaster and bandage which had been applied previously.

I saw him for the last time on the 24th of April, 1838. The same local treatment had been continued under the superintendence of his provincial surgeon. The joint was now scarcely larger than the other: it was quite stiff. He was free from pain, except a slight aching occasionally, and might be considered as well, though it still seems desirable that he should abstain from violent exercise.

CHAP. IV.

SCROFULOUS DISEASE OF THE JOINTS, HAVING ITS
ORIGIN IN THE CANCELLOUS STRUCTURE OF THE
BONES.

SECT. I.

Pathological Observations.

THE term Scrofula is often employed without much precision; and indeed it is not always easy to determine to what symptoms it may or may not be properly applied. The more correct view of the subject seems to be, that it indicates, not any specific disease, but rather a certain morbid state of the general system, under which various local diseases (many of them having no manifest resemblance to each other) may have their origin. Some individuals are born with a disposition to suffer from this class of diseases, often deriving it by inheritance from their parents; but there is no one, however strong his natural constitution may have been, in whom the same diseases may not take place when in a state of debility, consequent on insufficient nourishment, measles,

scarlet fever, or any other depressing illness, or exposure to other hardships.

Many practitioners are accustomed to regard nearly all the chronic diseases of joints as scrofulous: but I hold this to be altogether a mistake. Persons of scrofulous habit are not more liable than others to the diseases which form the subjects of the preceding chapters. There is, however, another malady affecting the joints having all the characters of scrofula, generally occurring in persons who have a scrofulous appearance, and often preceded by, or combined with, other scrofulous symptoms.

In this disease, which according to my experience is next in order of frequency to the affections of the synovial membrane, the cancellous structure of the bones is the part primarily affected; ulceration of the cartilages covering their articulating surfaces taking place afterwards. The cartilages being ulcerated, the subsequent progress of the disease is in many respects the same as where the ulceration takes place under other circumstances.

CASE XXIII.

Thomas Scales, aged eighteen, having a scrofulous appearance, was admitted into St. George's Hospital on the 18th of October, 1815.

He complained of pain, which he referred to the inside of one foot. The pain was constant,

but slight, and not sufficient to prevent his walking as usual. There was very little, if any, tumefaction, and the parts were not tender to the touch. He was also in a general ill state of health: there were symptoms of derangement of the functions of the liver, and the urine was turbid, depositing a quantity of sediment, which stained the vessel that contained it of a pink colour. He was heavy and stupid, and scarcely able to give any consistent account of his ailments. There were some small ulcerations at the edges of his eyelids.

While he was under a course of remedies for these complaints, he was seized, in the beginning of February, 1816, with a continued fever, of which he died on the 1st of March.

On dissection, the foot, which had been the seat of the pain, was particularly examined. The bones of the tarsus, and metatarsus, were found to contain an unusually small quantity of earthy matter; so that they were preternaturally soft, and admitted of being cut in any direction with a scalpel, without turning its edge. The cut surfaces of these bones were of a deep red colour, in consequence of increased vascularity; and vessels injected with their own blood could be distinctly traced extending from the bones into the cartilages covering them, and rendering the latter, in a few spots, of a red colour. The cartilage covering the internal cuneiform bone, where it forms the joint with the metatarsal bone of the great toe, was ulcerated to a small extent.

The ulceration had begun on that side of the cartilage which was connected to the bone; the surface towards the joint remaining entire. The bones of the tarsus were more diseased than those of the metatarsus; and those on the inside of the tarsus were affected in a greater degree than those on the outside. The bones of the other foot were affected in the same manner, but in a much less degree. The articulating extremities of some other bones were examined, and were found nearly in a natural condition.

CASE XXIV.

December 21st, 1814. In a boy apparently about ten years of age, whose body I had the opportunity of examining after death, I observed the following appearances:—

Both elbows were slightly swollen. On the fore-part of the right arm, immediately above the elbow, there was the orifice of a sinus, which extended downwards obliquely into the cancellous structure of the bone, where it terminated, without communicating with the cavity of the joint. The cancellous structure of the articulating extremities of the humerus, radius, and ulna, was so soft, that it might be crushed by a very slight degree of force when squeezed between the fingers: it was of a dark red colour, preternaturally vascular; and there was a reddish fluid, mixed with medulla, in the cancelli. The car-

tilages covering the radius and ulna were in a natural state; that belonging to the humerus was ulcerated in a few spots on the surface towards the bone, while on the surface towards the cavity of the joint it was entire. There were no morbid appearances of the ligaments or synovial membrane.

The bones of the left elbow were in a similar state of disease; the cartilages were entirely destroyed by ulceration; and carious surfaces of bone were exposed. A small portion of dead bone had exfoliated into the cavity of the joint, where it lay surrounded by matter. The synovial membrane and ligaments were extensively destroyed, and there were several sinuses communicating with the joint and opening externally.

On examining the right knee, which externally had not the slightest marks of disease, and admitted of perfect motion, the cancellous structure of all the bones which enter into its composition was found in the same morbid condition with that of the bones of the elbows, being preternaturally red and vascular, with a much less proportion than is usual of earthy matter, so that it admitted of being crushed by a very slight force. In the interior of the lower extremity of the femur, between the two condyles, there was one part where the earthy matter seemed to have entirely disappeared, and there was in consequence an irregular space, in which there was little else than medulla and a reddish fluid mixed together; near this part, the cartilage had only a

very slight adhesion to the bone, and ulceration had begun on its inner surface.

In several other joints, which were examined, there were marks of the same disease, but in a less advanced stage.

CASE XXV.

John King, twenty-six years of age, having blue eyes, thick lips, and a florid complexion, was admitted into St. George's Hospital, on the 1st of June, 1811, on account of a disease in his right ankle and foot. I received the following account of his case, partly from himself, and partly from a medical practitioner, who was in the habit of seeing him before he came into the hospital.

About the end of May, 1810, he wrenched his foot. The instep and ankle became swollen and painful, but in a few days these symptoms subsided. During the summer he experienced slight pain and weakness of these parts, whenever he took more than his usual quantity of exercise. In October a slight tumefaction was observed on each side of the ankle, and the pain was more severe, but still not sufficient to prevent his going about his usual occupations. About the middle of December, the pain became more violent, and he was confined to the house for a fortnight; after which the pain abated, so that he was able to go about with the assistance of a crutch.

In March, 1811, an abscess burst on the outside of the foot. The formation of the abscess was not attended with any considerable degree of pain.

He formerly had been supposed to labour under incipient *phthisis pulmonalis*; but from the time of the disease having begun in his foot, he had suffered no inconvenience from the complaint in his lungs.

At the period of his admission into the hospital, there was a diffused œdematous swelling of the soft parts over the whole foot and ankle. On the outside there were the orifices of three or four sinuses, which had burst at different periods. He had very little pain even on motion or pressure. Soon after his admission, another abscess broke on the inside of the heel.

On the 11th of July the leg was amputated.

On examining the foot, the cells of the cellular membrane were found distended with serum and coagulated lymph.

All the bones had undergone a morbid change, similar to what was observed in the last case, except that they were even softer and more vascular.

The cartilages of the ankle were completely destroyed by ulceration, and the exposed surfaces of bone were in a state of caries. The cartilages of the tarsus were entire, but, in some places, of a red colour; and this was found to arise from vessels containing red blood, extending into them from the bone. The ligaments

and synovial membranes of the tarsal joints were in a natural state, as were also those of the ankle, except where they had been destroyed by the abscesses.

CASE XXVI.

This patient was a soldier in the Coldstream regiment of Guards. I once had an opportunity of seeing him before amputation was performed; and, through the kindness of the medical officers of the regiment, I was favoured with the previous history of the complaint, and with the opportunity of examining the amputated joint.

William Miles, twenty years of age, of a delicate complexion, with red hair and dilated pupils, was attacked with a slight pain and swelling of the left knee, about the middle of January, 1808. On keeping quiet for a few days, the swelling subsided; but it returned about the end of March, though still attended with very little pain.

He was received into the hospital of the battalion at Chatham; and, on the 9th of June following, he was sent to the regimental hospital in London.

At this time the diseased knee measured in circumference three inches more than the other. Fluid was felt external to the joint, and in the cavity of the joint itself. The leg was kept extended, and all attempts to bend it gave con-

siderable pain ; but otherwise, the pain which he endured was trifling, amounting only to a slight degree of uneasiness, deep-seated in the joint. On the 8th of July, an abscess burst near the inner edge of the patella, and discharged about eight ounces of thin pus. On the 27th of July, the limb was amputated.

On examining the knee, the articulating extremities of the tibia and fibula were found to be so soft, that they were readily cut by a common knife: they contained much less earthy matter than is usual, and their cancelli were filled by a yellow cheesy substance.

The cartilage covering the head of the tibia was destroyed by ulceration in a few spots at the margin. That of the femur was eroded for a very small extent behind the crucial ligaments. The patella, and the cartilage covering it, were in a natural state. Coagulated lymph having a gelatinous appearance, had been effused into the cellular texture, on the outside of the synovial membrane. Pus was found external to the joint, and in the joint itself.

CASE XXVII.

Charles Miller, twenty years of age, having blue eyes, light hair, and a fair complexion, was admitted into St. George's Hospital, in April, 1808, on account of a disease of one foot.

The whole foot was swollen and œdematous,

with two fistulous sinuses, one on the inside, and the other on the outside, through which a small quantity of scrofulous matter was discharged. A probe having been introduced into either of these sinuses, some exposed surfaces of bone might be distinguished.

On the 16th of May, the limb was amputated below the knee.

On examining the amputated foot, the muscles were found pale and wasted from want of use, and the cellular membrane was distended with coagulated lymph.

The extremities of the tibia and fibula, all the bones of the tarsus, and the extremities of the bones of the metatarsus, contained much less earthy matter than is usual. They were so soft, that they might be cut with a scalpel without the edge of it being turned. They were preternaturally red and vascular, and a yellow cheesy substance was deposited in the cancelli. The cartilage at the base of the fifth metatarsal bone was destroyed by ulceration. Those at the bases of the three middle metatarsal bones were also destroyed, and the exposed surfaces of bone were dead, and undergoing the process of exfoliation. The cartilages of all the other bones were in a natural state. Pus and coagulated lymph had been effused in the neighbourhood of the dead and carious bones, and the sinuses communicated with them. The synovial membrane and ligaments were in a natural state, except where destroyed by ulceration.

CASE XXVIII.

Ellen M'Millan, eight years of age, was admitted into St. George's Hospital, on the 6th of March, 1833.

She complained of pain in the right hip, extending down the thigh, and much increased by motion, or by pressing the articulating surfaces against each other. The foot was everted. The limb was of its natural length. She had been observed to limp in walking about six weeks ago, since which the symptoms had progressively increased.

In the beginning of April, while under treatment for the disease of the hip, she became affected with other symptoms, indicating the existence of disease in the brain; under which she sank and died on the 6th of that month.

On examining the body, a scrofulous tubercle was discovered in the lower part of the right hemisphere of the cerebrum, and the vessels of the brain generally were found to be turgid with blood.

In the right hip, the cartilage of the head of the femur, in the neighbourhood of the attachment of the round ligament, was found to have been destroyed by ulceration, and of the round ligament itself scarcely any vestige remained. The cartilage of the acetabulum was also ulcerated to some extent at the lower part. The bone of the pelvis, where it forms the aceta-

bulum, and the head and neck of the femur, were of a soft consistence, so that they could be divided by a knife; and there was a considerable deposit of yellow substance in the cancellous structure of the latter.

On examining the bones of the left hip, they were found to be affected in the same manner as those of the right hip, but they were in a less advanced stage of the disease.

The cartilage of the head of the left femur was detached with unusual facility from the bone below, the surface of the latter presenting a highly vascular appearance; and, in two spots, the layer of the cartilage towards the bone was destroyed by ulceration, while that towards the cavity of the joint remained entire. The space thus formed between the cartilage and the bone was occupied by a vascular substance having the appearance of granulations.

CASE XXIX.

A girl, fifteen years of age, was admitted into St. George's Hospital, in the winter of 1809, labouring under symptoms of disease of one hip, as well as of one elbow. After remaining some months in the hospital, she left it of her own accord in the beginning of August. In the following October she was readmitted with the disease both of the hip and elbow much advanced. There was a large abscess in the thigh;

her general health was much impaired, and she sank and died in less than six weeks after her re-admission.

On dissection, the abscess in the thigh was found communicating with the cavity of the hip-joint, through an ulcerated opening of the capsular ligament, and synovial membrane. The cartilages of the hip had entirely disappeared; the bones were carious; the acetabulum had been rendered deeper and wider, and the head of the femur smaller than natural. The capsular ligament and synovial membrane were thickened, and a soft organised mass, similar to the substance of adhesions, was found adhering to the neck of the femur. The cancellous structure of the bones was softer than natural, so that it might be cut with a scalpel, or crushed between the fingers; and the appearance of it in other respects corresponded to that of the diseased bones in the cases which have been just related.

The disease of the elbow was similar to that of the hip-joint; but it had made less progress. The ligaments and synovial membrane of the elbow were nearly in a natural state, and some thin portions of cartilage still remained lying on the surface of the carious bone, but having little or no adhesion to it.

CASE XXX.

Margaret Mc Quinie, five years of age, was admitted into St. George's Hospital, March 27, 1839.

There was considerable enlargement of the hip-joint of the right side; and in some parts the fluctuation of fluid was distinctly perceptible. The thigh was bent forward on the pelvis, the lower extremity of it resting on the limb of the other side.

Every attempt to move the limb, the pressure of the head of the femur against the acetabulum, and pressure in the groin, caused considerable pain. The child seemed to suffer but little pain otherwise.

Soon after her admission, an abscess in the neighbourhood of the hip was opened, and a large quantity of pus was discharged.

The general health was a good deal affected; and it gradually grew worse. The local suffering also increased. There were painful startings of the limb at night. The feet became œdematous; and the child gradually sunk and she died on the 28th of November.

On dissection, the thigh was found considerably bent on the pelvis. There were extensive abscesses in the cellular membrane in the immediate vicinity of the joint, but there was no pus in the joint itself. The synovial membrane was in a state of great vascularity, especially at

the lower part of the joint. The cartilage covering the head of the femur had been partially absorbed. In some parts it was so thin that the dark surface of the bone was plainly to be distinguished through it. In other parts it was ulcerated in spots, in such a manner as to present an appearance as if it had been worm-eaten. In no one part was the absorption of it so complete as to expose the subjacent surface of bone.

The cartilage lining the acetabulum had been absorbed to a much greater extent. At the lower and inner part it had wholly disappeared, this part of the joint being occupied by a dense substance extending from the bone to the synovial membrane lining the capsular ligament.

The head of the femur rested on the margin of the acetabulum, immediately behind the joint. The capsular ligament was entire, but considerably dilated, having accommodated itself to the displacement of the head of the femur.

The bones were highly vascular, being of a dark red colour, and contained so little earthy matter as to be readily cut with a scalpel.

The preceding cases sufficiently illustrate the nature and progress of the disease, as far as these can be disclosed to us by dissection.

The morbid action seems to have its origin in the cancellous structure of the bones, which in the first instance is preternaturally vascular, with a less than usual proportion of the phosphate of

lime in its composition, there being at the same time a deposit of fluid, apparently serum, in the cancelli.

As the disease advances, the cancelli are found to contain a yellow substance, which is sometimes collected in large masses resembling the tubercular deposits found in other parts of the body. The vascularity of the articulating extremities of the bones become diminished, so that at last they are even considerably less vascular than healthy bones. Occasionally portions of bone lose their vitality, and are separated by exfoliation into the articular cavity. This last result is more frequently observed in the joints of the carpus and tarsus than in any others.

From the diseased bone, vessels may sometimes be traced, carrying red blood, and extending into the substance of the cartilage. The adhesion of the cartilage to the bone is less intimate than under natural circumstances, and sometimes it may be completely peeled off, the surface of bone thus exposed being of a deep red colour from excessive vascularity.

The cartilage afterwards ulcerates in spots, the ulceration usually beginning on the surface towards the bone; the interval between the bone and the cartilage produced by the ulcerative process being filled up with a highly vascular lymph.

The ulceration of the cartilage usually proceeds slowly. Then the bone itself becomes carious, and ultimately it becomes absorbed to a

great extent. In this stage of the disease, the bone is often of a dark colour, and offensive to the smell, in consequence of a purulent deposit becoming putrid in its cancelli.

As the bones become more extensively carious, inflammation takes place of the cellular membrane external to the joint. Serum, and afterwards coagulated lymph, is effused; and hence arises a puffy and elastic swelling in the early, and an œdematous swelling in the advanced, stage of the disease. Abscess having formed in the joint, it gradually makes its way through the ligaments and synovial membrane, and afterwards bursts externally, having caused the formation of numerous and circuitous sinuses in the neighbouring soft parts. It is remarkable that in one of the cases which have been related, although the disease of the bones and cartilage had made considerable progress, and there were extensive abscesses in the cellular membrane in the immediate vicinity of the joint, there was no pus in the joint itself. Such a case, however, must be regarded as a rare exception to the general rule.

In another case it has been stated, that thin layers of cartilage were found lying on the surface of the bone, apparently unconnected with it. In some instances, in the advanced stage of the disease, we find nearly the whole of the cartilage forming an exfoliation, instead of being ulcerated.

This scrofulous affection attacks those bones, or portions of bones, which have a spongy tex-

ture, as the extremities of the cylindrical bones, and the bones of the carpus and tarsus ; and the joints suffer merely from being contiguous to the original seat of the disease. Sometimes however the effect of this morbid condition may be traced even in the shaft of a cylindrical bone, so that we find the tibia or femur converted into a mere shell of earthy matter, enclosing a medullary canal of unusual magnitude.

In concluding this part of our enquiry, I ought not to omit to observe that a deficiency of phosphate of lime is not peculiar to the bones of those afflicted with scrofulous disease. It is the most essential change that takes place in cases of rachitis. There is, moreover, reason to believe that bones which, from any cause, have been during a long period of time left in a state of absolute rest, lose a portion of their earthy matter ; and the same thing occurs not unfrequently in bones which have been long in a state of caries, whatever may have occasioned the caries in the first instance. It was probably from the joint operation of the two last-mentioned causes, that in a patient who died some time after of a compound fracture of the leg near the ankle, and in whom the bones at the seat of the injury were in a state of caries, I found the cancellous structure in the neighbourhood as deficient in its hard materials, as it would

have been in a truly scrofulous subject. But in all such cases the other changes which mark the existence of scrofulous disease are wanting ; and this circumstance, combined with the previous history, is generally sufficient to enable the pathologist to distinguish these two classes of cases from each other.

SECT. II.

Symptoms and Diagnosis of this Disease.

THE scrofulous affection of the joints occurs next in the order of frequency to inflammation of the synovial membrane. Unlike the latter, it is chiefly met with in young persons under the age of puberty; and it is comparatively rare after the middle period of life.

The morbid change in the cancellous structure of the bones which constitutes the beginning of this disease, may exist without producing pain, or any other manifest symptoms. It seems to be not until the commencement of ulceration of the cartilages that the patient experiences even the slightest inconvenience. Even then it often happens that, for a long time, the symptoms are not sufficiently urgent to cause any degree of anxiety to himself or his friends. There is probably no disease more insidious than this is in its origin; and at the same time there is none in which it is more important that the first access of it should not be overlooked.

The symptoms which are common to cases of this disease in different joints are, 1st, pain, which is trifling in the first instance, but which often becomes very intense ultimately. 2. Swelling of the joint, at first from an effusion of

lymph and serum into the neighbouring cellular texture, afterwards from abscess within the joint itself. 3. Stiffness of the joint, which, in cases of recovery after extensive destruction of the cartilages, terminates in complete ankylosis. 4. Painful startings of the limb, especially at night, which may be considered as being, in the majority of cases, indicative of the commencement of supuration. 5. Abscesses presenting themselves externally in the neighbourhood of the diseased joint, with sinuses more or less complicated, according to the structure of the parts in which they are situated. 6. In many instances displacement of the bones, arising from the destruction of the ligaments of the affected joint, or of a partial absorption of the bones themselves. 7. In protracted cases (where the patient's powers are exhausted by pain, long-continued purulent discharge, and want of air and exercise), perspirations at night and other symptoms of hectic fever.

In individuals of scrofulous habit one disease leads on to another. A child apparently healthy suffers from an attack of scarlet fever or measles, which leaves him in a weakened state. As a consequence of this, some one or more of his joints become the seat of scrofulous disease. If this be neglected, it ultimately reacts on the constitution, and when the patient has for some time laboured under hectic symptoms, the usual consequences of great prostration of the bodily powers ensue. Tuberculous matter is then de-

posited in the lungs or mesenteric glands ; or there is a serous effusion into the ventricles of the brain ; and it is, almost invariably, the establishment of a new disease in some one of the vital organs, and not the disease in the joint itself, that is the immediate cause of death in those cases which terminate unfavourably.

Having given this general history of the disease, I proceed to trace its progress in particular joints.

When the hip is affected, the first indication of the disease is generally nothing more than a slight limp in walking. I have in very many instances known a child to be thus affected for several months before the parents have suspected that there was any actual disease. At last it is observed that he occasionally puts his hand to his hip or knee, and complains of pain in one or the other of these joints, generally in the latter. Still even at this period his expressions of pain are often so trifling and so rare that they attract but little attention. From this time, however, the pain goes on increasing. If the limb be now examined, while the patient is in the recumbent posture, it is found that the pain is aggravated by pressing the head of the femur into the socket of the acetabulum, and also by certain motions of the joint, especially the abduction of the thigh from the other. It is also found that the motion generally is more limited than that of the other hip ; and especially that the femur does not admit of such complete

flexion on the pelvis. Often at this period there is some enlargement of the lymphatic glands in the groin.

If the examination of the limb be made while the patient is in the erect posture, there is a manifest and very characteristic alteration in its appearance. He stands so as to throw the whole weight of the body on the other limb. On the affected side the thigh is slightly bent on the pelvis, as the leg is on the thigh, the foot being at the same time a little in advance of the other foot. The nates on the same side are wasted and flattened, and flaccid to the touch; they hang more loosely towards the lower edge, and have the appearance of being wider than natural, though they are not so in reality. The explanation of the altered appearance of the nates is, that the patient has avoided using the muscles of the hip, and that those at the posterior part, especially the *glutæus maximus*, are wasted.

As the disease advances, there is a slight degree of swelling in the groin, independently of the glandular enlargement, accompanied with tenderness. The proximity of the groin to the hip joint sufficiently explains the last-mentioned symptoms, but it is certain that in some cases there is actual tenderness of the knee also, to which the pain is only sympathetically referred. I have sometimes been led to believe, where the sympathetic pain of the knee was considerable, that there was even some degree of puffy swell-

ing observable in it. These facts correspond to what may be observed in some other cases, where pain is referred to a sound part, in consequence of a sympathy existing between it and some other part which labours under disease. Thus a calculus passing down the ureter, if it be long retained there, may occasion not only pain but swelling, and actual inflammation, of the testicle.

The increase of pain which takes place in what may be called the second stage of the disease is very different in different cases; and it seems to depend very much on the treatment employed, being less intense where the patient has been confined to the recumbent posture at an early period, than where he has continued to use the limb. In all cases, however, when suppuration has taken place, the pain is aggravated. There are sudden and painful startings of the limb, especially at night, and the patient, if a child, frequently is roused from his sleep under the influence of some frightful dream. The pulse is now increased in frequency, and this is generally accompanied with other symptoms of hectic fever. Ultimately the abscess formed within the joint makes its way into the parts external to it, and at last presents itself under the integuments, and this change is generally attended with some relief from suffering, especially as to the startings of the limb. Still every attempt to move the limb is productive of much pain, in consequence of the carious surface of the bones, now

deprived of their cartilaginous coverings, being rubbed against each other. The abscess presents itself in various situations: on the inside of the thigh, below the groin, on the posterior part of the hip, under the glutæi muscles, and indeed in almost any part of the limb; and it is a longer or a shorter time in coming to the surface, according to the number of the muscles, or the thickness of the fascia over it.

In the early stage of the disease the limb has sometimes the appearance of being longer than that of the other side. This appearance is however altogether deceptive, and on a careful measurement being made with a tape from the anterior superior spinous process of the ilium to the patella or inner ankle, it is found that there is no elongation in reality. The pelvis is inclined laterally, so that it makes on the side of the disease an obtuse angle with the spine. This change in the position of the pelvis is the necessary result of the position in which the patient stands, and it sufficiently explains the apparent lengthening of the limb, which soon disappears on the patient being kept in the recumbent posture.

In the advanced stage of the disease the limb becomes not only apparently, but really shortened; and this change may be produced in various ways.

1. The head of the femur and the bony margin of the acetabulum may be in a great measure, or even in some instances wholly, destroyed by

ulceration. Then there is nothing to prevent the action of the muscles from drawing the femur upwards, and the limb becomes shortened, as in a case of fracture of the neck of that bone.

2. In other cases, the cavity of the acetabulum having been gradually filled up by a deposit of lymph and pus, and the internal (or round) ligament having been destroyed by ulceration, the head of the femur is thrust outwards until it has passed beyond the projecting margin of the acetabulum, so that there is nothing to prevent the bone from being drawn upward by the action of the glutæi muscles. Thus the head of the femur is lodged on the dorsum of the ilium, with the usual symptoms of a dislocation of the hip upwards and outwards; the limb being shortened, the thigh bent forwards, and the toes directed inwards. In such cases the head of the femur never can be restored to its original situation; and in protracted cases, the patient being emaciated, and the muscles wasted from long disuse, it may be distinctly felt by the hand, as if it lay with little else over it than the common integuments.

3. In other, but more rare cases, the head of the femur is thrust out of the acetabulum, in the direction forward. It may then be felt in the groin, resting on the ramus of the pubes. The limb is shortened, but in a much less degree than where the dislocation has taken place upwards and outwards. The thigh remains nearly on a

line with the trunk, and the toes are turned outwards. The difference in the result of these two kinds of dislocation, where the patient recovers, is very great. In the former case he is lame for life, can never bring his foot to the ground, and is doomed always either to walk with crutches, or to wear a machine to support the thigh, and fill up the interval between the foot and the ground. In the latter, the foot can be placed on the ground; and the patient can walk with perfect ease, although of course he limps, and is not fit for any very rapid kind of locomotion.

From whichever of the above-mentioned causes it may have taken place, the shortening of the limb is generally the forerunner of an abscess showing itself externally, and therefore it is always to be regarded as a very unfavourable symptom, not only in itself, but as indicative of other mischief. There are, however, some rare exceptions to this rule, and occasionally I have known the limb to be much shortened, and yet the patient to recover ultimately without the formation of abscess.

I believe that the history which I have just given will be found to represent with sufficient accuracy, the progress of this disease of the hip, such as it is in ordinary cases, and where it is not interfered with by successful surgical treatment. Anomalous symptoms may arise under the operation of circumstances peculiar to individual cases. I have known the whole of the affected limb become œdematous, and swollen to a great ex-

tent, apparently from obstruction to the circulation in the inguinal or external iliac veins, and yet the patient to recover. In the following case there were violent spasmodic actions of the muscles, quite different from those which produced the ordinary startings of the limb, and I am induced to place it on record, not only on account of its being remarkable in this respect, but also because it is very illustrative of nearly all the more important facts belonging to the pathology of this disease.

CASE XXXI.

Captain D., in mounting his horse some time in the year 1820, experienced an acute pain in the right hip, which was not, however, of long duration. He afterwards felt occasionally similar sensations, which were generally induced by walking; but the pain was not severe, and therefore attracted very little of his attention.

In December 1822, he was attacked with pain in the same hip, which did not subside as formerly. It caused lameness, so that he could not proceed many yards without stopping to rest. This pain increased, and in February 1823, he suffered so much that he was wholly incapable of going from home except in a carriage. He now consulted an eminent surgeon, who recommended the application of leeches, blisters, &c. One evening, after the application of leeches, he

had a paroxysm of violent pain, attended with spasmodic action of the muscles of the thigh. The pain, during this attack, was so excruciating, that, to use his own expression, he wished for immediate death. He took not less than 150 drops of laudanum before he obtained relief. From this time, however, he was never wholly free from pain; and he was also liable to repeated attacks of more intense suffering, attended with violent spasms of the muscles of the thigh. The slightest motion of the limb induced one of these attacks of spasm, during which the thigh was jerked in a most remarkable manner for a period of some minutes. He was in this state when I was first consulted, in the summer of 1823. In September, 1823, the spasmodic affection gradually subsided; and in the course of the October following, a tumour presented itself on the anterior part of the thigh, in the situation of the femoral blood-vessels. The tumour appeared to contain fluid, and in one part of it a pulsation was perceptible, which might have led a careless observer to mistake it for an aneurism. About the same time, he became affected with a cough, lost his appetite, was languid, and exhausted by the slightest exertion. Soon afterwards he expectorated pus; and he died with symptoms of *phthisis pulmonalis*, on the 11th of December.

On examining the body after death, the lungs were found extensively diseased, containing

tubercles, many of which were in a state of supuration. The cartilages of the right hip had been destroyed by ulceration, and the bones of the joint were in a state of caries. On making a section of the head of the femur, it was found to contain a less quantity of earthy matter than exists in a healthy bone, with a deposit of yellow substance in its cancellous structure. The synovial membrane and capsular ligament were considerably thickened, and a mass of coagulated lymph had been deposited round the neck of the femur. There was a collection of thin pus among the muscles on the internal part of the thigh, below the hip-joint, but communicating with it. The abscess formed a tumour of the size of a large orange, and, being situated under the femoral artery, the latter was thereby raised out of its natural situation. There were two enlarged lymphatic glands, each of the size of a walnut, immediately below the crural arch, on the fore part of the joint, these being in contact with, and immediately behind, two branches of the lumbar nerves which lay over them, as the strings lie over the bridge of a violin.

No disease had been supposed to exist in the left hip previous to the patient's death, but on examining it afterwards, the head of the femur was found to be softer than natural, so that it could be divided with a scalpel. In some parts the vascularity of the bone was preternaturally increased; in other parts it was less than na-

tural, and a yellow cheesy substance had been deposited in its cancelli. The synovial membrane and ligaments were in a natural state.

At the time when this case occurred, I was led to believe that the circumstance of the two branches of the lumbar nerves lying, as it were, stretched over the two enlarged lymphatic glands, afforded a reasonable explanation of the violent muscular spasms to which the patient had been liable. My later experience, however, has led me to doubt whether this be the correct explanation. It is to be observed that there was a deep-seated abscess, situated among the muscles of the thigh below the hip-joint, beneath the femoral artery, and of course beneath the anterior crural, and close to the obturator nerve, and bound down by the femoral fascia; and that the subsiding of the spasms was immediately followed by the appearance of the abscess on the fore part of the thigh. Precisely the same combination of circumstances existed in two other cases on which I was consulted; and from the state of these facts, it seems to me to be a just conclusion that the peculiar symptoms arose from the deep-seated abscess pent up among unyielding parts, and thus pressing on, and irritating, the anterior crural and obturator nerves; and that the abatement of them arose from the removal of the pressure on the nerves, by the abscess making its way externally. It is worthy of notice that in a case of hernia of the *foramen ovale* of the

pelvis, in which the intestine was strangulated in the opening through which the obturator nerve passes, the most distressing symptom under which the patient laboured, was a painful spasmodic contraction of the muscles. This fact was reported to me by Mr. Weatherfield, of Covent Garden, by whom the patient was attended, and who gave me the opportunity of inspecting the parts after death.

The first indication of the disease, when it affects the knee, is generally an almost imperceptible limp in walking, occasioned by a slight degree of stiffness of the joint. This may exist for weeks, and even for some months, without attracting any serious attention. At last the patient begins to complain occasionally of pain; and now, on examining the joint, it is found to be slightly swollen, the enlargement appearing to arise altogether from a slight effusion of lymph into the cellular tissue, external to the synovial membrane. The appearance of the joint is usually very characteristic. The leg is slightly bent on the thigh, and the condyles of the latter projecting anteriorly with the effusion of lymph which has been just mentioned, the knee presents a rounded appearance, which it is difficult to describe in words, but which the eye of an experienced surgeon will never fail to recognise. The leg admits neither of complete extension, nor of complete flexion; but between these two points the mobility of the joint is

but little impaired, and the movement of it gives no pain, if it be confined within the limits which have been just mentioned.

If the disease be still allowed to take its natural course, the joint becomes more and more enlarged, and the rigidity of it becomes more complete, until at last it admits of no motion whatever. The pain gradually increases, and by-and-by it becomes constant, there being at the same time a severe aggravation of it, on even the slightest movement of the limb. The increase of pain here, as in cases of the corresponding affection of the thigh, indicates a more extensive destruction of the cartilages, and the commencement of suppuration within the joint. Ultimately abscesses present themselves externally, and burst on the inside or outside of the joint, leaving sinuses which continue to discharge matter. These sinuses sometimes lead directly into the interior of the joint, so that a probe may be at once passed into it, and brought into contact with an exposed surface of bone. More frequently they take a circuitous course, winding under the fascia, and among the tendons of the flexor muscles of the leg, so that their course cannot be traced by a probe.

Usually, when the knee is affected, the patient, if left to himself, keeps the leg in the half bent state. The consequence is, that the flexor muscles acting feebly, but constantly, without any counteracting force, frequently draw the head of the tibia backwards towards the ham.

In fact there is a complete dislocation backwards, the condyles of the femur making an unnatural projection anteriorly.

This disease is of not unfrequent occurrence in the joints of the tarsus. Here, also, it commonly for a considerable time attracts little or no attention. Ultimately pain is felt, there is an œdematous swelling of the tarsus, which ultimately includes the whole foot. In neglected or aggravated cases the swelling is sometimes enormous. Abscesses form, which are generally slow in coming forwards, and burst in various places. There is no form of the scrofulous disease of the joints, worse in its symptoms or more difficult to relieve than this. It extends from one joint of the tarsus to another, and here, much more than in the less complicated joints, portions of bone are apt to lose their vitality, becoming afterwards detached, by ulceration, from the living bone, and forming exfoliations, which are so wedged in by the neighbouring structures that they can neither be brought to the surface by a natural process, nor safely removed by art. The progress of the disease in the joints of the *carpus* is very similar to that in the joints of the tarsus; but here, on the whole, it has a less formidable character. The difference is, I conclude, to be attributed to the tarsus having to support the weight of the body, and to its being at a greater distance from the vital organs.

It is unnecessary to enter into any specific

history of the disease as it affects other joints, as, allowing for the difference in their situation and connections, the observations already made are applicable to them. It may be also needless to observe, that, whatever may be the joint affected, in the advanced stage of the disease the patient's general health suffers, as in cases of disease of the hip, though in a less degree when it has attacked the smaller joints than when it is seated in the larger.

SECT. III.

Treatment of Scrofulous Disease of the Joints.

ALTHOUGH the scrofulous disease of the joints presents itself under a great variety of aspects, and is always, even in the most favourable cases, tedious in its progress, and although there is no disease in which more depends on the surgical treatment employed than in this, still nothing can be more simple than the principles on which that treatment should be conducted. The observance of a few plain rules is all that is required in ordinary cases. At the same time, the surgeon whose notions have been formed by the study of the surgical literature of the last generation must endeavour to unlearn very much of what he has been taught. The disease is always indicative of defective bodily powers, and whatever tends to their further depression is injurious. The abstraction of blood, even by means of leeches, can be required only under some peculiar circumstances; and, even when it is thus required, the good which is done is not unmixed with evil. The repeated application of leeches may be regarded as never necessary, and as being invariably injurious. The same may be said of all kinds of what has been called counter-irritation, such as blisters,

issues, setons, and the use of the tartarised antimonial ointment. There is one occasion on which some remedy of this kind may be employed for the relief of pain, as will be explained hereafter, but this is of rare occurrence, and otherwise I am satisfied that all these painful remedies are not only not useful, but that they are actually mischievous. The maintenance of the general health is necessary to the patient's recovery, and as the long continuance of a purulent discharge cannot fail to be more or less injurious in that respect, it seems to be a very injudicious course to maintain such a discharge, for any long period, artificially. Children also suffer in another way. An open blister, or an issue, or seton, is a source of constant uneasiness, while the dressing which is required is a source of daily apprehension and anxiety. To those who know how necessary a hopeful and cheerful state of mind is to a vigorous and healthy state of body it would be a waste of time to point out the importance of this last observation.

The morbid condition of the bones, which precedes the ulceration of the cartilages and the formation of the abscess, is not to be relieved by local remedies. It depends altogether on the state of the system generally; and although, as I believe, some medicines may be prescribed with very great advantage, a still more important part of the treatment is, attention to the mode of life in other respects, persevered in during many successive years.

As a general rule, children who are thus afflicted will derive much benefit from passing the greater part of each year on the sea-coast. They may bathe in the open sea in the summer, and use the warm sea bath during the winter. The air of the country is to be preferred to that of a crowded city, and in fine weather they should pass as much of their time as possible out of doors. They should live on a plain nutritious diet, avoiding many of those articles which are given to children, not because they are wholesome, but because they are agreeable to the palate. The bowels should be carefully regulated, without recourse being had to anything like drastic purgatives. Occasionally, a wrong state of the secretions furnished by the organs of digestion, may indicate the administration of some alterative doses of mercury, but mercury should never be used on any large scale, so as to place the system under its specific influence.

It is more difficult to determine the real value of remedies in a disease which is so completely chronic, than it is in acute diseases; but, from the long experience which I have now had, I am satisfied that, of what are called tonic medicines, none are so generally useful in these cases as preparations of iron. They must be given, however, not merely for a few weeks every now and then, but, with occasional intermissions, for a very long period of time. To children I generally give some simple preparation, such as the *vinum ferri* of the old pharmacopœia, or

the syrup of the citrate, and sometimes of the iodide of iron, for three or four weeks. I then direct it to be omitted for a week or ten days, then to be given again; and so on, for two or three years, or even for a longer period. If the dose given in the first instance should prove to be too stimulating, it may be diminished. For those children with whom iron does not agree, other tonics, one at one period, another at another, may be substituted for it, — quinine, decoction of cinchona, sarsaparilla combined with the *liquor potassæ*, or infusion of gentian. The mineral acids, on the other hand, may be given when the appetite fails, or there is a disposition to night-sweats. I do not venture to say that the iodine of potassium, or other preparations of iodine are never useful in these cases; but my own experience has led me to believe, that great as the beneficial influence of these remedies undoubtedly is in many other diseases, their usefulness in the various forms of scrofulous disease has been very much overrated. But there is another remedy, regarding which, although I have had much less experience of its effects than I have had of iodine, I cannot doubt that it may be often employed in these cases with the greatest benefit, I allude to the cod-liver oil. A child may take a teaspoonful three times daily, and an adult may take a proportionally larger quantity, for three or four months at a time. It is quite compatible with the ex-

hibition of iron, which may be given in the intervals, or simultaneously with it.

With regard to local treatment the question will here arise, if the surgeon is precluded from the use of leeches, blisters, and issues, what is there left for him to do? The answer is, that in the early stage of the disease, the simple negative treatment, of keeping the diseased joint in a state of complete repose, is all that is required; and that this may, in the very great majority of instances, be best accomplished by the application of splints made of stiff leather, or gutta-percha, carefully moulded to the exact figure of the limb, and sustained by a suitable bandage. These splints may be lined with a soft leather, for which, however, in cases of abscess, and for the reasons formerly given, oiled silk may be substituted.

When an abscess is approaching the surface, and the skin is inflamed and tender, it will sometimes be necessary to remove the splints for a time, and to have recourse to fomentations and poultices; but they should always be replaced very soon after the abscess has burst or has been opened.

It is not generally advisable to open an abscess while there is any considerable mass of substance between it and the skin, on account of the hæmorrhage, which, even when of trifling amount, may be productive of great mischief, in consequence of some of the blood finding its way into the cavity of the abscess, and mixing with the pus

secreted into it. Such an admixture is liable to putrefaction; and, being in this state pent up within the cavity of the abscess, it produces all the symptoms of typhus fever, and may thus even lead to a fatal result.

As a general rule, I believe that it is advisable to open an abscess connected with a diseased joint, rather than to allow it to burst spontaneously; but the opening should be deferred until the skin is become thin over it, except in a few cases in which it is burrowing among the muscles of the limb under a thick fascia.

There are few questions in surgery of greater practical importance than that which relates to the management of an abscess connected with a diseased joint. The subject has been already briefly noticed in a former chapter; but it deserves further consideration. The observations which I am about to offer are applicable to all such abscesses, whether having their origin in the scrofulous disease, or in any other of the other diseases to which the joints are liable.

I have formerly made various experiments with a view to procure the absorption of these abscesses by artificial means; but as they were all alike unsuccessful, it is needless for me to explain them further than by stating the general result. Still I do not feel myself justified in asserting that there is no such thing as the spontaneous cure of an abscess by absorption. I have certainly seen several instances of tumours, having all the external characters of an abscess,

which in the course of a few months, and sometimes in a much shorter space of time, have wholly disappeared. The question, however, will always remain, whether such a tumour was really an abscess, or simply a collection of serum. A young woman was admitted into St. George's Hospital, having a tumour containing fluid, tender to the touch, and with the skin over it inflamed, on the anterior part of the pectoral muscle, near the axilla. Not doubting that it was an abscess, I punctured it with a lancet, and a considerable quantity, not of pus, but of pure serum, escaped. Some time afterwards a similar tumour presented itself in the neighbourhood of the former one, which I did not puncture, and this disappeared spontaneously, without discharging its contents. If I had not punctured the first tumour, I might probably have regarded each of them as affording an example of an abscess having been removed by absorption.

It is of great importance that tumours which are formed by a collection of serum should be distinguished from those which contain pus. However it may be as to the latter, there is no doubt that the contents of the former not only may be, but that they generally are, absorbed. At the same time a free opening of them is frequently productive of considerable inflammation followed by suppuration, and in many instances by great constitutional disturbance. Wherever there is any doubt on the subject, the tumour should

first be punctured by a grooved needle, so as to ascertain the nature of its contents. If there be a serous fluid, no further opening should be made. If there be pus, a larger opening may be made afterwards.

I have not found that the method of treatment by evacuating the contents of the abscess and then healing the puncture, as recommended by the late Mr. Abernethy, is attended with any advantage where an abscess is connected with a carious joint. Indeed, this corresponds with what a little consideration might lead us to expect. If an abscess takes place as a primary affection, the disease being confined to the soft parts, there may be nothing to prevent the contraction of the cyst, and the gradual diminution of the quantity of pus evacuated at each puncture. But where an abscess occurs in consequence of an ulcerated state of the articular cartilages and bones, as the cause of the abscess exists equally after as before the puncture, the suppuration will necessarily be kept up, and the contraction of the cyst, and the obliteration of its cavity, will be prevented.

There are great objections to the opening the abscess by a small puncture. Even if the orifice should not (as frequently happens) become obstructed by portions of solid lymph impacted in it, neither at the time of its being made, nor afterwards, does such a puncture afford a free passage for its contents. A certain quantity of pus accumulates in the cavity of the abscess, the

overplus escaping through the artificial orifice, as the overplus of water escapes through the waste-pipe of a cistern. Under these circumstances, the purulent discharge is invariably profuse; for a lodgement of pus operates like a pea in an issue, by stimulating the secreting surface and augmenting the secretion.

The practice which has appeared to me to be, on the whole, the best, is the following. An opening having been made with an abscess-lancet, the limb may be wrapped up in a flannel wrung out of hot water, and this may be continued until the first flow of matter has ceased, a poultice, or water dressing, being applied afterwards. In some instances, after a short time the discharge ceases; the orifice heals, and the puncture may then be repeated some time afterwards. But where the puncture has not become closed, I have never found any ill consequences to arise from its remaining open. On the contrary, I have no doubt that it is desirable that the wound should not be closed until the abscess has contracted, granulated, and healed from the bottom; and this is one reason for making, not a small puncture, but a free opening with an abscess-lancet. Another reason is, that the matter will escape readily without squeezing or pressure. *All rough manipulation is to be carefully avoided.* It produces hæmorrhage into the cavity of the abscess, the ill consequences of which I have already pointed out; and, independently of this, it may excite inflammation of the cyst, attended,

where the surface is extensive, with so much constitutional disturbance as to endanger the life of the patient at the time, and materially lessen the chance of his recovery afterwards.

The treatment of the sinus which is left after the opening of an abscess may be comprised in a few words. If the orifice be disposed to heal prematurely, this may be prevented by the occasional application of the caustic potash, care being taken that the caustic does not enter the sinus itself; otherwise some simple ointment or a water dressing is all that is required. The old practice of probing a sinus scarcely ever affords us any useful information; nor does it in ordinary cases answer any other good purpose. On the other hand, by irritating the sinus, or even the joint itself, it is often productive of serious mischief. The same observation is applicable, but with greater force, to the use of stimulating injections. I do not believe that they promote the healing of sinuses under any circumstances; but, with respect to those which are now under our consideration, there is no doubt that their operation is highly injurious. I saw a young man who nearly lost his life in consequence of a surgeon having ventured to inject port wine into a sinus connected with some diseased or dead bone of the pelvis.

When this disease affects the hip the patient should be immediately confined to the recumbent

posture on a bed or sofa ; and this rule should be strictly observed, however little advanced the disease may be. Long experience has satisfied me that it is impossible to arrest its progress, if the patient be allowed in the smallest degree to exercise the limb, or to allow it to support the weight of the body. In order that this part of the treatment may be fully carried out, it is desirable that the bedstead or sofa should be provided with the various conveniences belonging to that contrived by the late Mr. H. Earle* ; and that the patient's dress should be such as may be easily changed without his sitting up for that purpose.

It is very important that attention should be paid at an early period to the manner in which the patient lies. If left to himself we generally find him on one side, with the thigh bent at a right angle to the trunk, and the pelvis much twisted to one side. If he should recover with the limb ankylosed in this manner, the foot can never be brought nearer to the ground, and the limb is not only not useful, but actually an incumbrance to him. If the surgeon be not consulted until the disease is far advanced, it is not easy for him to rectify the mischief which has already taken place, but he can do much to prevent it if he be consulted in the beginning. The patient should be placed on his back, with the thigh, if not

* Very useful bedsteads constructed on this principle, but with various improvements, are made by Chapman, in Denmark Street, Soho.

absolutely in a line with the trunk, bent only in a very small degree forwards. Not only will the limb be then a useful limb, even if the joint be ankylosed, but there will be a much less probability of the head of the femur escaping from the socket of the acetabulum, and being dislocated on the dorsum of the ilium. With a view to prevent the motion of the joint, and at the same time to maintain the limb in a proper position, a splint, such as I have already described, made of thick and stiff leather, or of gutta-percha, may be applied so as to embrace one side of the pelvis and two thirds of the circumference of the thigh, and extending from the short ribs nearly as low as the knee. This, being fixed by a strap and a buckle to the pelvis, and in the same manner to the thigh, will be very convenient to the patient, and at the same time will well answer the intended purpose. Such a splint needs to be very rarely removed, except for the purpose of cleanliness when there are abscesses or sinuses discharging matter.

In some cases, where, the disease being in an advanced stage, there seemed reason to apprehend a displacement of the head of the femur, with a retraction of the limb, I have endeavoured to prevent it by the application of a moderate but constant extending force. For this purpose a leather strap was applied above the condyles of the femur, having a string attached to it, passing over a pulley, fixed, at a moderate height, to the lower end of the bedstead, and supporting a

light weight, the pelvis being at the same time fixed by a strap to the middle or upper end of the bedstead. This in some instances seemed to relieve pain, and I am inclined to think that it was useful otherwise, by counteracting the muscles, which tended to draw the limb upwards. However, it almost always happened that something occurred to prevent the experiment being fully and fairly tried; and all that I can venture to say respecting it is, that it may be worth while in certain cases to give this mode of treatment a further trial.

Occasionally, when the disease in the hip has been productive of a more than usual amount of pain, I have known the patient to experience much relief from the application of several small blisters in succession, or from the insertion of a seton in the groin, immediately in front of the hip joint. The large vessels and the nerve, which are here at so short a distance from the surface, seem to forbid the establishment of an issue by means of caustic in this situation. My conviction, as I have already stated, is that there is scarcely any other occasion on which it is proper to have recourse to any kind of counter-irritation in cases of this disease.

The length of time during which it is necessary that a patient labouring under the scrofulous disease of the hip should be confined to the recumbent posture, must necessarily vary in different cases. Where the disease is in its advanced stage, with abscesses already formed, no

better cure can be expected than ankylosis, and for the completion of this process some years may be required. On the other hand, where suppuration is not yet established, a few months of strict confinement may be sufficient, all violent exertion being avoided afterwards. A girl, sixteen years of age, who laboured at the same time under symptoms of caries of the spine and also of disease of the hip, died after having been under treatment for a few months. On examining the body it was found that there was extensive disease of the spine, with abscess. In the hip joint there was no suppuration, the cartilage had disappeared from nearly one half of the surface of the acetabulum, but the ulcerated surface was completely cicatrized, the cartilage being replaced by a membranous substance which adhered closely to the bone, and completely covered what would have been otherwise a broad exposed surface.

In an old case of diseased hip joint, the head of the femur may sometimes be felt lying on the dorsum of the ilium; and in consequence of the general emaciation of the patient, and the wasting of the muscles, with so little soft parts over it, that it seems to be almost immediately beneath the common integuments. In such a case it has been proposed to make an incision on it, and remove the head and neck of the femur by a saw. It would appear that this operation has been actually performed with some degree of advantage, and I do not doubt that circumstances

may occur to make it worth while to have recourse to it. But it is to be observed at the same time, that all that can be thus accomplished is the removal of one portion of the disease, and that it is the largest portion of it, in the bone of the pelvis, which is necessarily allowed to remain. The operation cannot be performed without a certain degree of local disturbance, and more or less of loss of blood; and taking all those things into consideration, I conceive that we should not recommend it except where some very unequivocal advantage may be expected from it.

When the disease is seated in the knee, the joint is best supported by two lateral splints, broad enough to enclose two-thirds (or more) of its circumference, and extending from the middle of the thigh to the middle of the leg. In cases of abscess the patient should be confined to a sofa or bed, until some very manifest improvement has taken place. Afterwards he may begin to walk with the aid of crutches, taking care that he never places his foot on the ground so as to throw on it the weight of the body. When there is no abscess he may use crutches from the beginning. If the leg be bent, as the cure advances, the machine which I have already described, consisting of two splints connected by a hinge, adapted to the posterior surface of the thigh and leg, and admitting of being approximated or separated by a screw, should be applied, so that the leg may be gradually brought into a more favourable position. This will promote the

restoration of the mobility of the joint, if there be reason to believe that this object may be still attained; and if ankylosis be the result, it is important that it should take place under such circumstances that the patient may be able to use the limb in walking. The most convenient position for this purpose is that in which the leg is not quite extended, but very slightly bent on the thigh. It sometimes happens that the patella becomes ankylosed to the femur, while the tibia and femur are still moveable on each other. This partial degree of mobility is not only no advantage, but it is a very serious disadvantage to the patient; and here, the use of the splints should be persevered in until the femur is as firmly united to the tibia as it is to the patella.

When the disease affects the ankle, the joint may be supported by two lateral splints, including the lower part of the leg and the sole of the foot, and the patient may be allowed to walk, with the knee supported by a common wooden leg, such as is used when amputation has taken place below the knee.

Lateral splints may also be applied where the disease is in the joints of the tarsus. But where it has its seat in those of the metatarsus with the toes, or of the toes themselves, a leathern splint should be moulded to the entire sole, with its margins turned over the inside and outside of the foot. Over this a large cloth boot, made to lace in front, may be worn, and the patient

may then walk about as usual, without any injury to the diseased joints.

The shoulder is not very commonly affected with the disease: when it is so the arm should be fixed to the side by a strap passing round the chest and fastened by a buckle, the forearm being supported by a light leathern boat suspended from the neck. In some cases, also, the shoulder may be protected by a leathern splint, neatly moulded to its shape, and fixed by a strap and buckle below the opposite axilla.

The diseased elbow is best supported by two lateral splints; as the wrist is by a splint adapted to its palmar surface, extending upwards to within a short distance of the elbow, and downwards to the tips of the fingers, and doubled at its margins over the sides of the hand and forearm. At first it is important that the motion, even of the fingers, should be prevented; but after some time a greater latitude may be allowed in this respect, and the splint may be shortened, so as not to extend beyond the palm of the hand.

Splints are equally adapted to the smaller as they are to the larger articulations; and there is no part of the body in which the excellent effects of this simple mode of treatment are more manifest than in the thumb and fingers. Much, however, in these cases, will depend on the mode in which the splint is applied. It is not sufficient, merely, that the splint should support the finger which is the actual seat of the disease; and

in many instances it is advisable that it should be constructed so as to support the entire hand.

Among the labouring portion of the population, and in hospital-practice, the scrofulous disease of the joints always presents itself under unfavourable circumstances. The early symptoms by which it is indicated are almost invariably overlooked, and surgical advice is seldom obtained until the disease has made considerable progress. When, at last, the patient is admitted into an hospital, the affected joint is in such a state that some long period of time, probably two or three years, may be required, even with the most careful management, for its cure. In the first instance, from the more complete repose, and the better diet which the hospital affords, a manifest improvement takes place. But after the lapse of a few months the general health begins to suffer from the air of the hospital. The patient is then sent back to his own home, where he can neither have the proper attention, nor partake of the generous diet which his case demands. The disease in consequence proceeds to its most advanced stage, and when for the second, or perhaps for the third time, he is admitted into the hospital, it probably is for no other purpose than that of having the limb removed by amputation.

Among the more affluent classes of society,

and in private practice, the results are very different from those which have been just stated. Here it is the fault of the parents if the disease is not attended to in the first instance; and this being the case, its progress may, by proper treatment, be almost always stopped, unless there is some more than usually unsound state of constitution. Even where there is extensive ulceration of the articular surfaces, and abscess communicating with the joint, in a patient under ten or twelve years of age, the limb may, in the great majority of instances, be ultimately preserved. The principal exceptions to this rule are those cases in which the disease has its seat in the tarsal joints. But for the attainment of a cure, in addition to skill and attention on the part of the surgeon, there is required a large stock of patience and self-discipline on that of the patient and his friends. It is no small proportion of those who are born to the enjoyment of ease and affluence who expect such an exemption from the evils of life, as does not belong to human nature. Such persons, in cases of this as well as of most other chronic diseases, are too often not content to await the good which may gradually be obtained from a long perseverance in the use of some simple but efficient remedies. They pass from the hands of one empiric to those of another; listen to, and believe any promises which are made to them; and at last, when it is too late, discover that they have been in an error, and that in their anxiety

to obtain a speedy cure, they have lost the chance of that ultimate one which they might have obtained otherwise.

As the scrofulous condition of the bones is in these cases antecedent to the manifestation of the disease in the joint, so the apparent cure of the latter does not justify the conclusion that the bones themselves are restored to a healthy state; and for a long time afterwards it will be necessary that great attention should be paid to the patient's mode of life, and that he should persevere in the use of the remedies mentioned formerly, especially of preparations of iron. Without these precautions there is always a risk of the disease showing itself again, either in the joint originally affected, or in some other; and it may be observed that the same care which tends to preserve the joint may prevent the scrofulous disposition from manifesting itself in other and more important parts of the system.

It has been already stated, that where the disease has not gone so far as to terminate in supuration the patient may recover, with an useful and moveable joint, and that this may happen even when a considerable portion of the cartilage has disappeared. Otherwise there is no recovery except with ankylosis. The ankylosis is at first

only by soft substance. At last there is perfect bony union; so that when a section of the bone composing the joint is made, the cancellous structure of the one bone is plainly seen to be continuous with that of the other. But (in consequence probably of the peculiar state in which the bones are) there is reason to believe that a very long period of time usually elapses before this ultimate change is complete; and until it is so, all rough usage of the limb should be carefully avoided, and, in the lower limb especially, it will be prudent to keep the joint supported by something more than a common bandage.

It seems scarcely necessary, after the observations which have been already made incidentally, to add that where the organisation of the joint is completely destroyed, and the patient's general health is failing, not from any concurrent disease of the vital organs, but from the disease in the joint itself, the only course to be pursued is the removal of the limb by amputation. But a question as to the expediency of an operation may arise under other circumstances. The patient has hitherto not suffered as to his general health, or has suffered only in a slight degree. The condition of the diseased joint is such, that ultimate recovery is very doubtful, and it is certain that no better cure is to be expected than that by means of ankylosis, and even this cannot be looked for except after the lapse of a considerable time. Is the chance of the ultimate

preservation of an imperfect limb sufficient to repay the patient for all the trouble, and pain, and anxiety which he must undergo, in order that this object should be attained? Undoubtedly it is not, particularly with persons belonging to the lower classes of society, who have to support themselves by their bodily labour. There are, however, some other points to be taken into consideration; and altogether it is not so easy to determine respecting the propriety of an operation, as on the first view of the subject it may appear to be.

A girl was admitted into St. George's Hospital, who laboured under this disease in the bones and joints of the tarsus. Her foot was amputated by Mr. Griffiths. In about three weeks the stump was perfectly healed; but now she was seized with symptoms which indicated an affection of the mesenteric glands, which had not shown itself previously, and she died. On dissection, numerous glands of the mesentery were found enlarged, and containing a cheesy matter. Another girl, whose arm I amputated on account of a scrofulous disease of the elbow, became affected in the same manner immediately after the stump was healed. She also died, and similar appearances presented themselves on dissection. A man, whose leg was amputated on account of a scrofulous disease of the tarsus, in a short time after the operation began to experience symptoms which indicated the incipient state of

pulmonary disease: and soon afterwards the other foot became affected in the same manner as the first. These are a few of many cases which might be adduced, as leading to this conclusion,—that the occurrence of this scrofulous disease, in a particular joint, may be the means of preventing the scrofulous disposition from shewing itself in some other organ; and that if the affected joint be removed by an operation, there is more danger of disease breaking out elsewhere, than there would have been if the operation had not been resorted to.

But we may refer to another order of facts, as shewing that there are occasions in which the amputation of a scrofulous joint, instead of rendering other organs more liable to the same disease, may actually produce the opposite effect of preserving them from it. It is to be observed that this disease of a joint is very rarely more than the remote cause of death, and that, where the result is fatal, it almost invariably happens in the following manner. The patient is exhausted by hectic fever, and, in this state of debility, disease takes place in the mesentery or lungs, or not unfrequently in both these parts at the same time, and it is this visceral affection which immediately precedes dissolution. It is evident, then, that in many cases there is a period of time at which the amputation of the limb may be the means of preventing the establishment of a secondary disease. Nor is this all. Visceral disease, which

was previously in a state of inactivity, may assume a new form, and begin to make a rapid progress, under the depressing influence of the disease of the joint: and amputation, under these circumstances, may be the means of preserving the patient, if not altogether, at least for a considerable time, perhaps for several years. A young woman was admitted into the hospital labouring under a scrofulous affection of the ankle. It was of long standing, and there were abscesses communicating with extensive surfaces of carious bone. It was evident that there was no chance of cure for the disease in the joint. Nevertheless I did not think it right to propose to the patient that she should submit to the loss of the limb, as she had a troublesome cough, with a purulent expectoration, and other marks of affection of the lungs. She, however, on account of the pain which she suffered, earnestly implored that the ankle might be removed; and, not very willingly, I performed the operation. The stump healed readily. The pulmonary symptoms almost immediately subsided; and when I last heard of her, four or five years after the operation, she continued alive and well.*

It is evident, from these statements, that the question concerning amputation is, in many

* In a former edition of this work I gave another account of the termination of this case, which I have since found to be erroneous.

instances, one of a complicated nature, requiring the exercise of no small degree of judgment and discrimination on the part of the surgeon, and not to be determined, except after a minute investigation of the whole case, with respect to the disease in the joint itself, and also in whatever relates to the state of the general health at the time, and that of the constitution previously.

CHAP. V.

ON ULCERATION OF THE ARTICULAR CARTILAGES.

SECT. I.*Pathological Observations.*

IN the preceding chapters I have been content to assume it as a fact that the articular cartilages are liable to undergo changes corresponding to those which are the result of ulceration in other parts of the body, reserving the further consideration of this interesting subject for the present chapter, in which I propose to treat of ulceration of the cartilages occurring as a primary disease.

If a section be made of the articular cartilages in a growing child, canals or sinuses may be distinctly perceived in them, containing red blood. These are not constructed with the distinct tunicks of ordinary blood-vessels, nor is there any appearance of minute ramifications of vessels pervading the cartilage generally. Still it

would be unreasonable to doubt that they are intended to convey blood into these structures for the purposes of nutrition and growth.

But after the period of growth is concluded, no blood-vessels can be detected in healthy cartilages even on microscopic examination, and as modern researches in anatomy have shown that, not only nutrition, but absorption, and various changes of structure, may take place in the living body, independently of any distinct vascular apparatus, we are justified in the conclusion that, under the circumstances which have been just mentioned, no such apparatus exists.

In cases of disease, however, I cannot doubt that I have myself seen blood-vessels extending from the surface of the bone into the substance of the adjoining cartilage. But examples of this are recorded in the preceding chapter. Mr. Mayo has described a similar appearance *; and the late Mr. Liston has published a drawing of such vessels, filled with injection, as they appeared in the field of the microscope. † The latter gentleman was kind enough to show me the preparation

* Medico-Chirurgical Transactions, vol. xix. p. 49. Mr. Liston, indeed, has stated that the preparations referred to by Mr. Mayo exhibit nothing satisfactory on the subject. But it is to be borne in mind that Mr. Mayo's observations were made on the recent subject, and that it is difficult to suppose so accurate an anatomist to have been deceived in so plain a matter; while it is highly probable that appearances which were quite distinct while the parts were in a recent state, would be rendered obscure by long immersion in spirits.

† Medico-Chirurgical Transactions, vol. xxiii.

from which the drawing was taken, and it certainly seemed to me that there was no doubt that the parts were as they were represented by him to be. In saying this, however, I do not mean to affirm, nor did Mr. Liston, as I apprehend, mean to affirm, that blood-vessels extend into the articular cartilage of the adult when actually in a healthy state. It is, at all events, highly probable that some change in its molecular structure has always taken place before blood-vessels are generated in it; and in this there is nothing more remarkable than there is in the formation of vessels in extravasated lymph.

Interesting as these observations may be, as to the vascularity or non-vascularity of cartilages, and the mode in which the changes which they undergo in health and disease are produced, and important as the researches in minute anatomy, conducted by means of the microscope, may ultimately prove to be, it must be acknowledged that the time has not yet arrived at which the results can be applied, with much advantage, to the advancement of practical surgery. In whatever way it may be accomplished, whether by the developement and destruction of cells, or by means of capillary vessels, or partly by one, and partly by the other, there is no doubt that cartilages are nourished and grow, and undergo changes of organisation, and that they are absorbed, and die, and exfoliate, very much in the same way as parts which are distinctly vascular. And, after all that can be said on the subject, the

difference in these respects between cartilages and the other animal structures is probably more apparent than real. There can be no more doubt that the former derive new materials in some manner from the vessels of the bone to which they are attached, and that their old materials pass into the general circulation through the same channel, than that the fœtus somehow derives its nourishment from the maternal portion of the placenta. Nor should we lose sight of this consideration, that even in these organs, which are endowed with the highest degree of vascularity, it cannot be supposed that every change which takes place is by the distinct agency of blood-vessels. The latter supply the new materials, but they cannot occupy every point of space, and there must be intervals between them in which it is probable that molecular changes are taking place, corresponding to those which occur in what are called extra-vascular organs.

In the museum of St. George's hospital there is a preparation exhibiting the patella with its cartilage in a state of hypertrophy, that is considerably increased in thickness, though still retaining, apparently, its natural structure. Unfortunately the particulars of the case are not recorded, further than that it was taken from a patient who had suffered from inflammation of the tibia.

The degeneration of the articular cartilages into a fibrous structure, the fibres being attached to the bone at one extremity, and projecting into the cavity of the joint at the other, is a frequent occurrence, especially in advanced life. It often precedes other changes, as will be explained hereafter.

A wasting or total absorption of the articular cartilages may occur under a variety of circumstances. It may arise from mere want of use, under the influence of the same law as that to which we refer the wasting of a paralysed muscle. I was consulted respecting a young lady who had laboured under a caries of the dorsal vertebræ, with angular curvature of the spine. She seemed to have recovered of this complaint under the care of an eminent surgeon; but nevertheless she had (of her own accord, and contrary to the wishes of her surgical attendant,) remained in the recumbent posture for more than six years. I strongly advised her to begin to sit up, and then to stand and walk, and try to exercise her limbs. How it happened I know not, but she was taken into the country, and my advice was not followed. Some years afterwards I was again consulted, and now I found that there was not a single joint of the lower extremities which was not completely ankylosed. Every attempt to restore their mobility entirely failed, and it was impossible to doubt that the cartilages had entirely disappeared, and that the bones were connected by complete bony union. I conclude

that, in such a case, the cartilages, in the first instance, became adherent, and then were gradually removed. In a case of ankylosis of the hip-joint, which I had the opportunity of examining after death, but with the previous history of which I was unacquainted, this kind of ankylosis seemed to be in progress, there being a very thin layer of cartilage still perceptible, to which the surface of the acetabulum and that of the head of the femur were firmly united.

In a patient who died in St. George's hospital, and in whom there had been a large abscess in the fore-arm, although that abscess had no communication with the wrist, I found a large portion of the cartilages of that joint to have become absorbed, the exposed surfaces of bone presenting very much the same appearance as if the cartilage had been removed by maceration. Two other cases similar to this have come under my observation, there being in neither of them any sign of inflammation, nor of any other disease of the joint, with the exception of the absorption of the cartilage. I conclude that in such cases the wasting of the cartilage may be regarded as being simply the result of defective nutrition, which was itself to be attributed to the demand made on the circulation by the neighbouring abscess.

In like manner I have found, in experiments on animals, that the ligature of the femoral artery has retarded the union of a fracture of the tibia for several days, and that a large abscess accidentally formed among the muscles of

the thigh prevented it altogether. I have in my possession a drawing of the astragalus of a patient who was under my care in St. George's hospital, in which this wasting of the cartilage was seen in different stages of its progress. On one of the surfaces, although there is no part in which it has completely disappeared, the cartilage is every where so thin and transparent, that the colour of the bone may be seen distinctly through it.

In the case just mentioned, the original disease seemed to have been a chronic inflammation of one of the bones of the tarsus, not like that of scrofulous disease, but with a deposition of bony matter in the cancelli, causing their texture to be harder, and not softer than natural. In that disease of the joints, to which the name of rheumatic gout is commonly applied, a somewhat similar wasting of the cartilage occurs. I shall have occasion to refer to this subject again hereafter.

It is plain that the wasting of the cartilage, which has just been described, is a process different from that of ulceration. But I do not see what other name than that of ulceration can properly be given to the process by which the cartilage is absorbed under some other circumstances. We find it softened, or otherwise altered in structure, occasionally with vessels carrying red blood ramifying in it, then gradually disappearing, often in such a manner as to present the appearance of distinct excavations in its

substance, and these changes being preceded by, and attended with, distinct signs of inflammation, and immediately followed by ulceration, or caries of the bone, where the surface of it has become exposed, with suppuration, and abscess in the joint.*

Ulceration of the cartilage may begin on the surface by which the cartilage is in contact with the bone, or on the free surface towards the articular cavity; and examples of both these forms of the disease may be found among the dissections recorded in the preceding chapters. In the former case there is first an increased vascularity of the surface of the bone, with a less close adhesion of the cartilage to it; so that the two may easily be separated from each other. Then, in most instances, the cartilage is excavated in spots on the side towards the bone, the space thus excavated being occupied by a highly organized lymph. The ulceration, pe-

* On the subject of the molecular changes in the articular cartilages which occur in connexion with disease, the reader may consult a memoir lately published by Dr. Redfern.

Mr. Birkett, in the Guy's Hospital Reports, observes, that "it is now a well-established fact that there is no such morbid process as ulceration of cartilage * * * * . The destruction of this tissue depends on a loss of nutrition and disintegration, in which the development of fat plays an important part." But it may be a question whether ulceration, in whatever part of the body it occurs, is not a process of disintegration, depending on a want of nutrition. Hence, as Hunter has observed, "it becomes in many cases a substitute for mortification."—*Treatise on the Blood, &c.*, chapter vi.

netrating through the whole thickness of the cartilage, is at last seen on the inside of the joint as a very small opening, which gradually becomes wider. In other instances, instead of such partial excavations, the cartilage, to a considerable extent, becomes gradually thinner and thinner, until at last it lies like a mere membrane on the carious surface of the bone below, and then wholly disappears.

When the ulceration begins on the free surface of the cartilage, it sometimes is at its extreme border where the synovial membrane is reflected over it, or close to the attachment of the internal or round ligament in the hip, or of the crucial ligaments of the knee-joint. But the ordinary course of events seems to be the formation of shallow excavations, which afterwards assume the appearance of grooves at a greater or less distance from the margin, and frequently in the central parts of the cartilage, far removed from all the other textures of which the joint is composed. These grooves afterwards become wider and deeper, until the surface of the bone is exposed, which now becomes ulcerated or carious also.

The appearances which have just been described are sometimes met with in cases of inflamed synovial membrane having those processes or elongations extending into the cavity of the joint, which have been formerly described. My friend, the late Mr. Aston Key, in an interesting paper published in the "Medico-Chirurgical

Transactions," has recorded the history of a case of this kind, in which the processes of the synovial membrane were seen lying in contact with the ulcerated surfaces; and from this and some other circumstances, he has been led to infer that this kind of absorption of the cartilage is to be attributed, not to any change originating in the cartilage itself, but to the action of the vessels of the synovial membrane; and further, that when inflammation of the last-mentioned structure is followed by ulceration of the cartilage, the ulceration is always accomplished in the same manner; the vessels of the cartilage being, in fact, unequal to such a process of destruction.

If this opinion be correct, it establishes a new fact in pathology; as I am not aware that there is any instance, in other parts of the body, of the ulceration or absorption of one living texture being effected by the action of the vessels of another, there being no continuity of substance between them. I cannot, however, admit that the facts stated by Mr. Aston Key justify the conclusion at which he arrived. The fact is that the peculiar mode of absorption of the articular cartilages which is here referred to, is not at all confined to those cases in which inflammation of the synovial membrane has gone so far as to produce processes, or elongations of its substance, projecting into the articular cavity. It may be observed equally, where no such degeneration of the synovial membrane has taken place, and

even where the synovial membrane is not inflamed at all. Ample proofs of the correctness of this statement will be found among the dissections recorded in the preceding chapters, and in those of which I shall give an account hereafter, and in adducing the following case, I am led to do so, not because such additional evidence is required, but because the evidence which it affords is in itself sufficient, and that it may therefore prevent my having occasion to refer to the subject again hereafter.

CASE XXXII.

A boy, twelve years of age, on the 28th of June, 1809, fell from a height, and pitched on one of his knees. When he was brought to the hospital he was found to have a compound fracture of the femur. For some days he appeared to go on well; but afterwards an abscess formed in the thigh, extending as high as the nates; and he sunk and died on the 21st of July. On examining the knee-joint after death, the cartilage covering the condyles of the femur, and that covering the head of the tibia, were found, in some parts, entirely absorbed, so that the bone was exposed; while in other parts it was absorbed on the surface towards the cavity of the joint, the layer of it next to the bone retaining its natural adhesion, and apparently its natural structure. The cartilage, in these parts, was

formed into grooves, having an appearance as if the greater portion of its substance had been removed with a chisel.

There was no purulent nor other effusion into the cavity of the joint; and in my written notes of the case, taken at the time, it is not mentioned that the synovial membrane was in any degree inflamed. The condyles of the femur belonging to this case are preserved in spirit in the museum of St. George's Hospital, and, on examining them, I find that throughout nearly the whole of its circumference, for the breadth of one third of an inch, the cartilage remains of its natural thickness, and otherwise unaltered; while in the centre it has altogether disappeared, the grooved appearance being observable in the intermediate space.

I have already mentioned the occasional degeneration of some portion of the cartilages of a joint into a fibrous structure. Such an alteration is not uncommon in advanced life; and it is met with occasionally in younger persons. It is one of the causes to which a crackling of the joints (of which I shall have to speak hereafter) is to be attributed. For the most part it leads to no further change; but in some instances it is the antecedent of ulceration, the cartilage being destroyed, to a greater or less extent, and the bone itself being rendered carious.

CASE XXXIII.

In examining a body brought into the dissecting-room in Windmill Street, I found the cartilage in a diseased state in the joints of both hips, of one of the knees, and of both elbows. In some spots the cartilages of these joints were altogether destroyed by ulceration, and carious surfaces of bone were exposed; in others the cartilage was not completely absorbed, but it had the appearance of fibres, which were connected at one extremity to the bone, while the other extremity was loose towards the cavity of the joint, and having no lateral connection with each other. The intervertebral cartilages connecting the bodies of some of the dorsal vertebræ were also in a diseased state. They retained the usual appearance of concentric layers towards the circumference; but in the centre, instead of the white semi-fluid substance which is met with under ordinary circumstances, they were found to be of a brown colour, of a solid and somewhat brittle texture, composed of several portions having a very slight adhesion to each other. The ligaments, the synovial membranes, and the bones, were all in a natural state, except that the latter were in some instances carious, in consequence of the absorption of the cartilage, the caries being unattended by the formation of matter.

In several cases of which an account will be given hereafter, a similar appearance of the

articular cartilage was observed to exist, in connection with ulceration of the cartilage elsewhere, caries of the bone, and suppuration in the cavity of the joint.

In the preceding chapters I have given examples of ulceration of the articular cartilages occurring as the consequence of disease of the synovial membrane, and also in connection with a peculiar morbid condition of the cancellous structure of the bone belonging to what is termed a scrofulous state of the general system. In either of these cases the primary disease may exist for a long time before the secondary disease is established. But there are other cases in which this order of things is reversed, in which the ulceration of the cartilage being the first change that can be detected may be itself regarded as the primary disease.

This mode of expression is at any rate sufficiently accurate for all practical purposes, though it may not be always strictly and literally correct. Mr. Toynebee has shown that there is a peculiar structure of the plate of bone to which an articular cartilage is connected, by which the former is adapted to the support and nutrition of the latter, there being a relation between them corresponding to that which exists between the periosteum and the bone which it envelopes. As it may be a question whether the morbid action which produces a node of the periosteum begins in the bone, or in the periosteum itself; or whether it begins sometimes in the one, and

sometimes in the other; so a similar question may arise as to the origin of ulceration, and indeed of the other diseases of the articular cartilages. These, and the plates of bone to which they are attached, may indeed be regarded as parts of the same system; and it is more than probable that no material change can take place in the one without the other being, in a greater or less degree, affected by it.

Having made this explanation, I proceed to give an account of some cases which are intended to illustrate the foregoing observations, and will, I apprehend, be found sufficiently to explain the progress of the disease as far as it can be ascertained by dissection. In this, as in other parts of this investigation, I have been at much pains to avail myself of the opportunities which accidentally occurred of examining the morbid appearances in the very commencement of the disease, being satisfied that it is only in this way that a just knowledge of this or of any other disease can be attained, and that pathological observations, if limited to those cases in which disease has run its course, and all the textures of the affected organ are involved in one common destruction, are of comparatively little value.

CASE XXXIV.

John Cutmark, forty-four years of age, was admitted into St. George's Hospital on the 29th

of September 1813, with pains in the lower limb of the right side, extending from the hip to the knee, and resembling the pains of rheumatism. He attributed these symptoms to his having caught cold about a month before his admission. He laboured also under a complaint of his bowels, of which he died on the 4th of December. On dissection, no preternatural appearances were discovered except in the right hip. The capsular ligament and synovial membrane were in a natural state. The cartilage covering the head of the femur and lining the acetabulum had been destroyed by ulceration for about one half of their extent: and wherever the cartilage had been destroyed an ulcerated surface of bone was exposed. The round ligament was readily torn, in consequence of ulceration having extended to it at the part where it was inserted into the acetabulum. The bones possessed their natural texture and hardness. There was no pus in the joint. It was observed that the ulcerated surface of the acetabulum corresponded to that of the femur, these surfaces having been exactly in contact in the position in which the patient had remained since his admission into the hospital.

CASE XXXV.

Phœbe Harper, twenty-four years of age, was admitted into St. George's Hospital on the 29th of August, 1825.

About two months previous to her admission she had been seized, while employed in hay-making, with an excruciating pain in the lower limb of the left side. The pain subsided sufficiently to allow her to walk home; but on the following day it returned, and it was now referred principally to the groin. Leeches, blisters, and other remedies were employed, but the pain continued very severe.

At the time of her being admitted into the hospital she was unable to move the limb: the foot was turned outwards; and every attempt to press the head of the femur against the surface of the acetabulum, as well as all pressure in the neighbourhood of the hip-joint, occasioned violent pain, so as to make her scream. The whole limb was of a higher temperature than natural, and the pulse beat between 90 and 100 times in a minute.

Altogether the disturbance of the constitution was greater than might have been expected from such a local complaint.

October 24th, the patient died.

On dissection, it was found that no effusion either of serum, lymph, or pus had taken place into the cavity of the hip. The synovial membrane was somewhat more vascular than usual, but the increased vascularity seemed scarcely to amount to inflammation. The cartilage covering the head of the femur had been destroyed by ulceration for more than half its extent, the ulceration having proceeded so far as to expose

the cancellous structure of the bone. The remaining portion of the cartilage covering the head of the femur was thinner than natural, but not uniformly so, the change being greater in some parts than in others. Every where the loss of substance was towards the cavity of the joint, the layer of it next the bone, where any cartilage remained, being unaltered.

The cartilage of the acetabulum was every where destroyed, and a carious surface of bone was exposed.

There were no remains of the round ligament.

The synovial membrane on one part of the neck of the femur was destroyed by ulceration, and here also a carious surface of bone was exposed.

The bones themselves had their natural texture and hardness, not differing from healthy bones except on the ulcerated surfaces.

CASE XXXVI.

Ellen Davies, eighteen years of age, was admitted into St. George's Hospital on the 2d of September, 1837.

She complained of great pain, referred to one hip joint. The pain was aggravated by every attempt to walk, or bend the thigh on the pelvis, and when pressure was made on the joint. She was tormented by painful startings of the limb

at night, and was pale and otherwise of a delicate appearance.

She said that she had first experienced pain in the hip about a year and a half ago; and from that time her sufferings had been gradually increasing. There was no perceptible swelling. An issue was made with caustic behind the great trochanter, and she was placed on an invalid bedstead.

She was otherwise in ill health; and died about a month after her admission into the hospital.

On dissection, the synovial membrane was found to be somewhat thickened, but it bore no marks of inflammation. Within the joint, globules of white lymph were found clustered in great numbers round the neck of the femur. There were no traces of the round ligament.

The cartilage belonging to the head of the femur had been destroyed by ulceration to a great extent, and that which remained had only a very slight adhesion to the bone.

The cartilage at the upper border of the acetabulum had been destroyed by ulceration also. At this part the head of the femur rested on the brim of the acetabulum, the projection of the latter being received into a groove of the other bone. The ulcerated surfaces of bone, where exposed by the destruction of the cartilage, were highly vascular.

I have placed the three foregoing cases first in order, as they exhibit the early changes which the disease produces with little or no complications. The three which immediately follow are of much interest, as they afford examples of the disease in its early, and at the same time in its most advanced, stage in the same individual.

CASE XXXVII.

Thomas Herbert, fifty-eight years of age, was admitted into St. George's Hospital on the 14th of September, 1825.

He complained of pain and tenderness of the left knee. The leg was bent at a right angle with the thigh, and there was a severe aggravation of the pain on every attempt made to move it. There was a slight swelling of the joint, not arising from fluid in its cavity, but from an effusion into the cellular texture external to it.

The man was otherwise in ill health, and his memory was impaired; so that no history of the case could be procured.

Some time after his admission an abscess presented itself on the outside of the joint, and burst, discharging a large quantity of pus. It now became a question whether the limb should not be removed by amputation, but an attack of erysipelas prevented the operation. The patient gradually became more exhausted, and died in the beginning of December.

On dissection, the cartilage of the patella of the left knee was found in some parts destroyed, so as to expose the surface of the bone, while in other parts it had lost its natural structure, and was converted into a fibrous substance.

The cartilages of the head of the tibia and condyles of the femur were almost everywhere destroyed, so that extensive surfaces of carious bone were exposed.

The abscess did not communicate with the general cavity of the joint, but was limited to the portion of it formed by the external condyle of the femur and corresponding part of the tibia, and here the cancellous structure of the bones adjoining the ulcerated surfaces was of a dark colour. Everywhere else the bones belonging to the diseased joint retained their natural texture and hardness.

In the right knee, which had not been supposed to be diseased previously to the patient's death, the cartilage of the patella had in some parts entirely disappeared, so that the bone was exposed. In other parts it had become converted into a fibrous substance, while elsewhere it retained its natural structure and appearance.

The cartilages of the tibia and femur of the right knee were somewhat thinner than natural, and of a yellowish-white colour, but they were entire, except on the edge of one of the condyles of the femur, where the cartilage was in a state of incipient ulceration, the surface of the bone being exposed and of a red colour, in a spot about one third of an inch in diameter.

CASE XXXVIII.

David Martin, twenty-six years of age, was admitted into St. George's Hospital, on the 25th of July, 1810, on account of a disease in his right knee. He attributed it to a blow, which he had received some years previous; but he said that the symptoms had all been much aggravated within the last six months. At the time of his admission into the hospital, the knee had the appearance of being swollen; but, on examination, this was found to arise from the wasting of the muscles, rather than from actual enlargement. The leg was fixed, or nearly so, in the half-bent position. The condyles of the femur projected beyond the head of the tibia. He complained of pain, which was particularly severe at night. An issue was made with caustic on each side of the patella; but the symptoms were not relieved, and an abscess burst on the outside of the joint, discharging a large quantity of matter.

Soon after his admission, he experienced, for the first time, severe pain in the other knee; but this was unattended by swelling, or any alteration in the form of the joint, and the leg admitted of complete extension and flexion on the thigh. The pain continued, but no swelling ever took place.

In the beginning of September, he was seized with an accidental attack of erysipelas. Abscesses formed in different parts of the leg and

thigh; and he gradually sunk, and died on the 7th of November.

On inspecting the body, the right leg was found bent so as to form a right angle with the thigh. The head of the tibia had been drawn towards the ham by the action of the flexor muscles, so that the condyles of the femur were unusually protuberant. The lateral ligaments were in a natural state. There were no remains of the crucial ligaments, or semi-lunar cartilages. The cartilages of the tibia, femur, and patella had nearly disappeared. The bones were carious on their exposed surfaces, and dark-coloured, but not otherwise diseased. The synovial membrane was free from all morbid appearances, except at the points of its attachment to the bones, where, in a few places, coagulated lymph had been effused on its surface.

The left knee externally had its natural appearance, with respect both to form and size. The leg admitted of complete flexion and extension. On dissection, the ligaments and synovial membrane were found to be in a perfectly healthy state; but about one third of the cartilaginous surface of the tibia and femur had been destroyed by ulceration,—the ulceration having taking place principally, but not entirely, near the circumference. The cartilage of the patella and the semilunar cartilages were entire; but the latter in some parts were softer than natural. The bones were free from disease. There was no purulent nor other fluid in the joint.

CASE XXXIX.

A girl, seven years of age, was admitted into St. George's Hospital, in May, 1809, on account of a complaint in the left hip. She had pain in the knee, the limb was shorter than natural, and the nates were wasted and flattened. An issue was made with caustic, behind the great trochanter. Soon after her admission an abscess burst near the crista of the ilium. The disease in the hip appeared to be considerably relieved; but, on the 1st of August, she died of an accidental attack of erysipelas.

On inspecting the body, the glutæi muscles of the left side were found wasted, and of a dark colour. A sinus extended from the external orifice of the abscess through the soft parts, and communicated with the hip-joint, by an ulcerated opening in the margin of the acetabulum.

There were no remains of cartilage on the surface of the acetabulum. The exposed bone was in a carious state, and of a dark colour, and the cavity of the acetabulum was rendered deeper and wider than natural. The greater part of the cartilage was destroyed on the head of the femur, and the small portion of it, which remained, was readily separated from the bone; a circumstance which is often met with, where cartilage is undergoing the process of ulceration.

The capsular ligament was somewhat thicker

than under natural circumstances, and more closely connected with the surrounding parts. There were no remains of the round ligament.

In the anterior part of the joint, a quantity of organised soft substance, resembling that of adhesions, was interposed between the head of the femur and the acetabulum, and behind this was a collection of dark-coloured pus. From these two causes the head of the femur had been protruded from its proper situation, being afterwards drawn upwards by the action of the muscles, so that it was lodged on the dorsum of the ilium above the bony margin of the acetabulum. The synovial membrane was of a dark colour, but not otherwise diseased.

On examining the hip of the opposite side, I found the soft parts external to it, the capsular ligament, synovial membrane, and fatty substance of the joint, having no appearance of disease. The cavity of the joint contained about a drachm of dark-coloured pus. The cartilage was absorbed from about one third of the surface of the acetabulum. The exposed bone in most parts presented an uniform compact surface, but in two places it was in a state of superficial caries. In some parts of the head of the femur, the cartilage had a fibrous appearance, similar to what has been already described; in other parts it was entirely absorbed, and a carious surface of bone was exposed; and elsewhere it was in a natural state. The round ligament was ruptured by a very slight degree of force, which

seemed to arise from the cartilage having been destroyed near its insertion into the acetabulum.

The bones in the neighbourhood of the carious surfaces of the left hip were of a darker colour than usual; but no such appearance was observed in the bones of the other hip, which were in all respects in a healthy state.

It would be impossible, merely from the appearance observed in a particular case, in which, either from neglect or from the insufficiency of the remedies employed, the disease had been allowed to proceed to its advanced stage, to presume what that disease has been in its origin, or what had been the tissue primarily affected. In cases such as those which I have just described, in which the opportunity of examining the morbid appearances occurred at an early period of the disease, no such difficulty exists; and with the knowledge which they afford, I do not hesitate to offer those which follow, as affording a further illustration of the destructive effects which the disease may ultimately produce in three of the principal articulations.

CASE XL.

Jane Bannister, forty years of age, was admitted into St. George's Hospital, in September 1810, on account of a disease in the right foot. She gave the following account of her case: —

In the September of the preceding year she wrenched her instep, and soon afterwards experienced violent pain in this part, so that she was unable to stand on that foot, and her rest was much disturbed at night. The pain continued very severe, and, at the end of four months, she observed, for the first time, a slight swelling on the inside of the foot. This was occasioned by an abscess, which was opened by her medical attendant in the April following.

At the time of her admission into the hospital, the whole foot was swollen, and she complained of violent pain in it. The abscess continued open, discharging a small quantity of pus. On introducing a probe into the orifice, an exposed surface of bone was felt. Several applications having been made without benefit, the leg was amputated on the 25th of February, 1811.

On examining the amputated foot, the cartilages of the joint formed by the astragalus and os naviculare were found destroyed by ulceration, and a portion of the astragalus was dead, and undergoing the process of exfoliation. The cartilages of the joints formed by the cuneiform

bones with each other, with the os naviculare, and with the metatarsal bones, were in like manner destroyed, and the exposed surfaces of bone were carious. The abscess communicated with the carious joints. The ligaments and synovial membrane were in a natural state, except in a few spots, where they had been destroyed by the abscess. The bones possessed their natural texture and hardness. The cellular membrane of the foot contained coagulated lymph and serum.

CASE XLI.

William Bridges, twenty-one years of age, was admitted into St. George's Hospital, on the 28th of November, 1810. He gave the following account of his case:—About the middle of the May preceding, he first experienced a pain in the right knee, which was aggravated by walking. At the end of a month, the pain became so severe that he was under the necessity of being confined to his bed. He had slight pain in the hip; but that in the knee was intense, keeping him awake at night. An abscess formed, which, in the September following, burst on the inside of the thigh.

At the time of his admission, the nates were wasted and flattened; the limb on the affected side appeared to be an inch and a half longer than the other; there was a large abscess in the posterior part of the thigh. He was emaciated,

and laboured under a hectic fever. An issue was made with caustic, behind the great trochanter of the femur, and afterwards a second issue was made in the same manner on the anterior edge of the *tensor vaginæ femoris* muscle. Under this treatment he experienced for a time great relief, notwithstanding that several abscesses formed and burst in different parts of the thigh. He became free from pain; regained his flesh; the hectic fever abated: and the discharge from the abscesses was much lessened. The limb now appeared to be shorter than the other. He continued to mend till the middle of February, 1811. At this period the unfavourable symptoms began to return. He was affected with a constant diarrhœa, and profuse perspirations, and he died on the 26th of March following.

On inspecting the body, the glutæi muscles were found wasted and shrunk, and in many parts their texture was destroyed by the abscesses, which communicated with the cavity of the joint by two ulcerated openings, one on the anterior, and the other on the posterior part. The abscesses formed several sinuses in the neighbourhood of the joint, and the capsular ligament was in consequence connected, and in some measure blended, with the other soft parts.

The joint contained purulent matter. The synovial membrane was darker than natural, but otherwise had the ordinary appearance. There were no remains of the round ligament. The cartilages were everywhere absorbed, and the

exposed surfaces of bone were in a carious state.

The head of the femur was reduced to about two thirds of its original size, and the acetabulum was rendered deeper and wider, nearly in the same proportion. At the bottom of the acetabulum there was an ulcerated opening just large enough to admit a common probe, communicating with an abscess within the pelvis. The carious surfaces of the bones had the same dark colour and foetid smell as in other cases in which carious bones have been long bathed in pus, but otherwise they did not differ from healthy bones.

CASE XLII.

Mary Anderson, twenty-eight years of age, was admitted into St. George's Hospital, on the 6th of April, 1815.

At this time she complained of intense pain in the right knee, which was particularly severe at night, so as very much to interrupt her rest. The pain was referred principally to the head of the tibia. There was a slight swelling of the joint, having the form of the articulating ends of the bones, and not giving to the hand the smallest sense of fluctuation. The leg admitted of being moved on the thigh, but all motion aggravated the pain.

No more particular account of the previous history of the case could be procured than the

following:—that she had laboured under pains of the right knee for nearly six years, which had been occasionally relieved; and that, in the first instance, the pain had been unattended by swelling.

Immediately on her admission, an issue was made with caustic on each side of the patella. On the 9th of April the pain had very much abated. The issues were kept open by the occasional application of caustic; and the pains very soon left her, and the swelling diminished.

About the 8th of June, she began to experience a return of the pains in the knee, and in the course of four or five days they were so severe as to keep her awake at night. There were convulsive startings of the limb, and the joint was swollen in a greater degree than formerly. The pains increased in violence, and her health began to suffer considerably. On the 3d of July the limb was amputated.

On examining the knee, some lymph and serum were found effused into the cellular membrane external to it.

The cavity of the joint contained about half an ounce of thin purulent fluid. The cartilage covering the patella was in some parts in a natural state; in others it had the fibrous structure which I have described in a former part of this chapter; and in others it was completely destroyed by ulceration, so as to expose the surface of the bone. The cartilage covering the articulating extremity of the femur presented

the same variety of appearances. On the inside there was a spot of some extent, which, instead of cartilage, was covered by a kind of membrane resembling the substance of adhesions, but somewhat more dense in its structure, as if the cartilage had been formerly destroyed at this part, and coagulated lymph had been effused on the ulcerated surface of bone, and had afterwards become organised.

The cartilages of the tibia were ulcerated for a very small extent.

The synovial membrane in general was in a natural state. In some places it was slightly inflamed. On the outside of the joint it was inflamed in a greater degree than elsewhere, and thickened, and in a state of incipient ulceration in consequence of the abscess having begun to make its way towards the external surface.

The bones possessed their natural texture and hardness.

SECT. II.

Causes and Symptoms of this Disease.

THERE is this difference between the disease now under our consideration and that which formed the subject of the last chapter: the former belongs chiefly to the middle and subsequent periods of life, while the latter, in the very great majority of instances, occurs in children or in those who are little advanced beyond the age of puberty. This is a point of importance with reference to our diagnosis. Another circumstance not less important in this respect is, that the scrofulous affection of the joints generally is developed in those who are naturally of a weak habit of body, having what is called a scrofulous diathesis, or who are brought into that condition from insufficient nourishment, or under the influence of some depressing malady; whereas it is dyspeptic persons, of a sallow complexion, without any particular defect otherwise, who are more especially liable to the other disease. I have, however, observed that primary ulceration of the cartilages is often preceded by pains like those of rheumatism in other parts, and hence I have been led to conclude that it is, in many instances at least, the result of rheumatism affecting the harder textures. It will be seen

hereafter, that the effect produced on it by certain remedies is favourable to this opinion as to its rheumatic origin ; and in further confirmation of it I am led to give the particulars of the following case, which is interesting, not only because there is a distinct history of the local disease having been preceded by rheumatic pains elsewhere, but because the exact nature of the disease was ascertained by the dissection of the affected joint.

CASE XLIII.

Sarah Holder, twenty-two years of age, was admitted into St. George's Hospital, on the 26th of July 1827, with a diffused swelling extending from the upper part of the right thigh to the leg, a little below the knee. The swelling was most conspicuous in the immediate neighbourhood of the knee-joint ; and from thence gradually became diminished, having no defined termination either above or below. It was somewhat elastic, the skin over it appearing glossy and tense, but not redder than natural. The patient complained of exquisite pain, especially on pressure. The pain was also aggravated by every motion of the knee ; nevertheless it was principally referred, not to the joint itself, but to the thigh bone immediately above it. In addition to these local symptoms, the pulse was frequent ; the tongue furred, and rather brown ;

the skin hot; and the countenance anxious and expressive of much suffering. The condition of the patient was altogether a good deal similar to that which might be produced by severe rheumatic inflammation of the bone and periosteum; and the history of the case seemed to justify the opinion that such was the nature of the disease, as the symptoms had begun without any precursory rigor on the day previous to her admission, and had been preceded, for an entire month, by what were regarded as rheumatic pains in the elbows, and shoulders.

Saline and antimonial medicines were exhibited: leeches were freely applied to the limb, and on the 28th of July, a pill, containing two grains of calomel and half a grain of opium, was exhibited twice daily. Under this treatment, the gums became slightly affected, and the symptoms gradually abated. On the 3rd of August, the mercurial pill was given only once daily, and in the course of a few days more it was altogether discontinued, blisters being at the same time applied to the limb.

August 13. The swelling and pain had entirely left the upper part of the thigh; but there were still some remains of both in the immediate neighbourhood of the knee. Altogether she was in a much better state with respect to the local symptoms, and the general health was improving.

August 15. After an accidental exposure to cold, she had a rigor, followed by fever; and, at

the same time, there was a recurrence of pain and swelling in the neighbourhood of the right knee, with some degree of pain and tenderness extending up the thigh, and down the leg. The swelling had the same character as formerly.

August 20. She continued in nearly the same state, with painful startings of the limb, and perspirations at night. The pulse was very frequent. She was directed to resume the use of the calomel and opium.

Sept. 2. There was no material improvement as to the local symptoms: a blister was applied to the knee.

She continued in nearly the same state, sometimes a little better, sometimes a little worse, with a very frequent pulse, and the general health, on the whole, declining, until the 7th of October; when an issue was made with caustic in the neighbourhood of the knee. The issue seemed to occasion some abatement of the local symptoms. Her bodily powers, however, continued to decline, and she became affected with an ulcer over the sacrum, the result of long-continued pressure.

Oct. 14. She complained of severe pain in the left shoulder.

Oct. 15. She was seized with a vomiting and purging, accompanied with pain and tenderness of the abdomen and cold extremities. Pulse 140. At midnight she had a severe rigor.

The vomiting and purging continued, in spite

of the remedies which were employed. In the afternoon of October 16. she had another rigor, and in about two hours afterwards she expired.

On examining the body, the knee-joint was found to contain neither pus nor synovia. The cartilage of all the bones which enter into the composition of the joint were ulcerated in several places, especially that of the inner condyle of the femur. A slight extravasation of blood had taken place into the cavity of the joint, apparently from the surfaces of the bone exposed in consequence of the ulceration of the cartilages. The periosteum could be easily peeled off the surface of the femur, and the bone underneath appeared to be more vascular than is natural. The stomach was distended with an acid fluid of a green colour, similar to what had been vomited on the day preceding death. The gall bladder was full of a very pale yellow fluid. There were no other morbid appearances.

The left shoulder, to which pain had been referred for a short time previous to death, was carefully examined, but no disease was detected in it.

Mr. Mayo has published an account of some cases, in which ulceration of the articular cartilages had shown itself in the form of an acute disease, attended with urgent symptoms, and proceeding rapidly to its termination. Cases

similar to those which he has described have fallen under my own observation ; indeed that which has been just related (of Sarah Holder), may be considered as belonging to the class of acute rather than to that of chronic diseases. The following case is still more remarkable : —

CASE XLIV.

A young married lady was seized with violent pain in one knee. There was no perceptible swelling of the joint, or if there was any it was not from fluid or lymph effused into its cavity, but from a very slight effusion of serum into the cellular membrane external to it. In the course of three or four days the pain became intense, and could be only partially relieved by very large doses of opium. Blood was taken from the knee by leeches and cupping, but this afforded very little relief. Mercury was administered internally, and as soon as the patient was under the mercurial influence the pain began to abate. In the course of a few days more it had entirely subsided. The patient was supposed to be well, but the bones were now firmly united with each other, so that the joint did not admit of the smallest motion. Various plans were tried with a view to restore its mobility, but to no purpose. The ankylosis was, and still is, complete ; but as the leg is nearly in the straight position with

regard to the thigh, it is productive of comparatively little inconvenience to the patient.

There is, however, no doubt that such cases are exceptions to the general rule, and that in the ordinary course of things ulceration of the articular cartilages, when it occurs as a primary affection, has the character of a chronic disease.

In many instances, the patient having previously complained of what he considered as rheumatic pains in his limbs and loins, finds these pains to become at last, as it were, concentrated in a particular joint. In others the disease is supposed to have followed some kind of mechanical injury. Statements to this effect, however, are not always to be received with implicit faith. There is a disposition in the human mind to trace whatever occurs to some known cause, and there are no occasions in which this disposition is more strongly manifest than in what relates to bodily ailments. I do not say that the disease now under consideration never arises from mechanical injury; but all my experience leads me to believe that the effect of such injury is much more frequently to cause the development or aggravation of a disease which had begun previously, than to bring a new disease into existence.

The pain in the joint in a short space of time becomes severe, so that even in what may be

regarded as the earliest stage of the disease, it interferes with the patient's sleep at night: If proper treatment be not had recourse to, the pain continues to increase, is aggravated by any attempt to move the joint, and by the pressure of the articulating surfaces against each other, and at last is attended with muscular spasms, causing involuntary startings of the limb, especially during the night.

The question here suggests itself, "If the articular cartilages are not endowed with nerves, whence do such severe pains arise?" It may be answered that we have no right to conclude, because no nervous fibres are detected in these structures, that therefore they are altogether without nervous matter, or placed beyond the sphere of the nervous influence. It may also be observed that there are other parts of the body which have been supposed to be possessed of great sensibility when in a state of inflammation, though under ordinary circumstances they have no sensibility whatever. Still I am myself more inclined to the opinion that the increased sensibility in these cases is in the bony plate beneath the cartilage rather than in the cartilage itself, and that the presence of severe pains, with involuntary startings of the limb, is always to be regarded as a sign of the bone partaking of the disease.

There is, in the first instance no perceptible alteration in the appearance of the joint. After some time a slight degree of swelling shows

itself, the consequence of a serous effusion into the cellular membrane external to it. It rarely happens that in the early stage of the disease there is any effusion into the articular cavity. I have, however, notes of a case in which this happened after well-marked symptoms of ulceration of the cartilages of the knee had existed, without swelling, for five months. The joint became suddenly and considerably swollen; the swelling subsiding afterwards under the application of blisters. I conclude that it arose from an attack of inflammation of the synovial membrane supervening on the original malady.

The cases already recorded show to what an extent ulceration of the articular cartilages may proceed without suppuration being established. This is a remarkable circumstance in the history of this disease, but not altogether peculiar to it. There is one kind of ulcer of the leg which I have occasionally met with in hospital practice, which affords an example of the same thing in another order of textures. In the case here referred to, the patient complains of pain in one particular spot. Nothing is perceptible to the eye; but on placing the finger on it, the skin sinks into a pit, or depression, caused by the removal of the subjacent parts. By degrees the skin becomes thinner, and the depression more manifest. At last the skin is altogether destroyed by an ulcerative process extending from within outwards, and a painful irritable ulcer, now in a state of suppuration, is exposed.

In all cases, however, sooner or later, unless the ulceration of the cartilages and bones be stopped by art, suppuration takes place, and abscess forms within the joint. It would appear that it is at this period that the greatest aggravation of the symptoms takes place; and now if the joint be not superficially situated it becomes manifestly swollen from the purulent secretion collected in its cavity. If the joint be equally distended, it presents the same appearance as when it is swollen from an effusion of serum in consequence of inflammation of the synovial membrane. But in the majority of instances, the abscess being limited to one part of the joint, which is separated by adhesions from the rest, the swelling is of an irregular shape, prominent in one place, and scarcely perceptible in another. As the abscess increases in size, it gradually makes its way into the external parts, taking the course of an articular abscess arising under other circumstances.

Now this history is evidently very different from that of inflammation of the synovial membrane. The circumstance of the absence of swelling in the first instance in the one case, and the presence of it as almost the earliest symptom in the other, is alone sufficient to prevent an error in the diagnosis, when the surgeon is consulted before the disease is far advanced, or where an accurate statement of its progress can be procured. At a later period, indeed, when the whole joint has become dis-

organised, and the surrounding parts are penetrated by sinuses connected with it, it is always difficult, and in hospital practice often impossible, to arrive at an exact diagnosis. This, however, is of the less importance, as it would lead to no difference as to treatment, and as, except in very young patients, any further attempt to preserve the limb, where there is nothing to prevent the removal of it by amputation, is for the most part unadvisable.

It is with the cases of scrofulous disease, having its origin in the cancellous structure of the bones, that those of primary ulceration of the cartilages are most liable to be confounded, as they resemble each other in the absence of all swelling of the joint in the first instance. But here also it is in the most advanced stage of the disease, when the joint is much disorganised, that there is the greatest difficulty in arriving at a correct diagnosis. At an earlier period the same difficulty does not exist. I have already adverted to the different periods of life at which these diseases respectively occur, and the different constitutions of those who are liable to suffer from them. The following are the principal points to be attended to besides. In the scrofulous disease it appears as if the sensibility of the bones was actually less than under ordinary circumstances, so that it may be going on insidiously for many months before it is productive of any serious inconvenience; and the pain which is at last experienced seems to arise

rather from the joint being distended with matter, and from the abscess making its way into the surrounding textures, than from the actual ulceration of the cartilages and bones. But where the latter is the primary disease, the sensibility of the tissues seems to be morbidly increased. From the beginning there is pain on motion, and on pressing the articulating surfaces against each other; and, as has been already explained, only a short time elapses before the pain becomes severe and constant, causing great suffering, with involuntary startings of the limb; and this not only before there is any evidence of suppuration having taken place, but even in cases in which suppuration never takes place at all, so that a cure is effected without the formation of abscess. Indeed it is remarkable to what an extent this disease sometimes exists without abscess being the consequence of it, and this circumstance forms another important difference between these cases and those of scrofulous disease, in which it rarely happens that the cartilage is destroyed, even to a very limited extent, without abscess showing itself afterwards.

After this general statement of the symptoms and progress of the disease, it will not be necessary to give any very extended history of it as it affects particular joints.

In this as in other cases, where the hip is

affected, the pain is confined partly to the hip itself, but more especially to the knee. There is the same wasting of the muscles, producing a flattened appearance of the nates, the same apparent alteration in the length of the limb in the first instance, and the same real alteration afterwards, as in the cases of scrofulous disease. Here also there may be actual dislocation, the following example of which occurred under my observation, when I was yet a student at St. George's Hospital.

CASE XLV.

——. Taylor, a middle-aged man, was admitted into St. George's Hospital, on account of a disease in his left hip. He laboured also under other complaints; of which he died a few months afterwards.

On inspecting the body, the soft parts in the neighbourhood of the joint were found slightly inflamed, and coagulated lymph had been effused into the cellular membrane round the capsular ligament. There were no remains of the round ligament. The cartilages had been destroyed by ulceration, except in a few spots.

The bones, on their exposed surfaces, were carious; but they retained their natural form and size. The acetabulum was almost completely filled with pus and coagulated lymph;

the latter adhering to the carious bone, and having become highly vascular. The head of the femur was lodged on the dorsum of the ilium. The capsular ligament and synovial membrane were much dilated; and, at the superior part, their attachment to the bone was thrust upwards; so that, although the head of the femur was no longer in the acetabulum, it was still within the cavity of the joint.

Allowing for the differences which have been already pointed out, the progress of the disease in the hip is very similar to that of the scrofulous disease of the same joint; so that much of what has been already observed respecting the latter, is applicable also to the former. The pain, severe as it may be before suppuration is established, is always aggravated afterwards, especially in those cases in which the abscess is confined to the deep-seated parts by the pressure of the *iliacus internus*, *psoas magnus*, and the *adductor* muscles of the thigh, and in which the sufferings of the patient are sometimes so intense as to be almost insupportable. The chance of ultimate recovery, where abscess connected with the hip is formed, under these circumstances is so small that the case may generally be considered as actually hopeless. Yet many recover, in whom the scrofulous disease of the hip has terminated in this manner. The difference is easily ex-

plained. The subjects of the last-mentioned disease are generally young children, and those of the former are generally adults.

The ulceration of the cartilages of the knee is indicated by pain in the joint, which at first is slight and only occasional, being completely relieved if the limb be kept in a state of perfect quiet for a few days; otherwise the pain becomes constant and severe, especially during the night, preventing sleep. The pain is referred principally to the head of the tibia; but sometimes a slight degree of pain with actual tenderness extends down the whole of the shin. It is aggravated by handling the joint, by pressure of the surfaces against each other, and by motion; so that the patient cannot bear to change his position, keeping the leg sometimes straight, but more frequently moderately bent.

A considerable time may elapse before there is any appearance of swelling; and when it does occur, it is no more than a slight enlargement of the joint, produced by an effusion of serum into the surrounding cellular texture, quite different in its character from that which depends on the joint being distended with serum in a case of inflammation of the synovial membrane. Afterwards the existence of abscess is indicated by a great increase of size in some one part of the joint, there being perhaps comparatively little swelling elsewhere. There is now a further aggravation of the patient's sufferings. The abscess makes its way to the surface, sometimes in one direc-

tion, sometimes in another ; and ultimately there may be two or three or more sinuses leading to the interior of the joint.

In these cases also there may be a dislocation of the joint, produced by the action of the flexor muscles, where the leg has been kept in a half-bent state, drawing the head of the tibia into the popliteal space. I have known this to happen even when the disease has not gone so far as to occasion abscess. In the instance to which I allude, the patient recovered with the leg fixed in this unnatural position.

The history of this disease, as it affects the knee, is applicable, with some slight and obvious modifications, to the other joints which are superficially situated. The first symptom is pain unattended by swelling, and increased by the forcible pressure of the articulating surfaces against each other. The pain is always referred to the part which is the actual seat of the disease ; when the elbow is affected, the more severe pain in that joint is accompanied by a slighter degree of pain in the lower part of the fore-arm and wrist. It cannot be said that any joint in the body is altogether exempt from the disease ; but the liability to it is much greater in some joints than it is in others. It is very rarely met with in the joints of the lower jaw ; and it is for this reason that I think it worth while to record the following case, it being the only one of the kind which has fallen under my observation.

CASE XLVI.

A lady, thirty-three years of age, in November 1816, first experienced a pain in the articulation of the lower jaw, on the left side; and this was attended with a sense of stiffness, and a difficulty of taking and masticating food. Some liniments were used, which seemed rather to aggravate the complaint, and were therefore left off. From this time the symptoms gradually and slowly increased; and in May, 1818, when I was consulted, they were as follows:—There was severe pain in every motion of the lower jaw, especially in masticating the food and yawning. The pain was induced whenever pressure was made in the situation of the articulation of the lower jaw of the left side; but there was no tenderness on pressure being made elsewhere. From this part, however, as from a centre, the pain extended in various directions; to the temple; to the back of the head towards the lambdoidal suture; to the lower part of the orbit of the left eye, and even down the left arm. She said that it was impossible to describe the character of the pain, as she had experienced nothing like it before. When the fingers were applied to the joint, and the lower jaw was at the same time opened and closed, a grating sensation was communicated to them, as if the articulating surfaces had been deprived of their cartilages. There was no evident tumefaction. The patient

did not complain of her sleep being much disturbed; nor did her general health appear to be considerably affected, though her pulse was as frequent as 96 in a minute.

The caustic potash was applied so as to make a slough of the skin below the ear, opposite the condyle of the lower jaw, on the anterior edge of the *sterno-cleido-mastoideus* muscle. She now returned into the country, where she was under the care of Mr. Pitman of Andover, who removed the slough made by the caustic, and kept open the issue in the usual manner.

After the issue had been established for five or six months, and not before, there was considerable relief from pain. On the 21st of August, 1822, Mr. Wm. Pitman wrote me the following account of our patient:—"At this time she has the perfect motion of the jaw; but there is still the same grating sensation when it is moved as there was formerly, though in a less degree. She has the power of masticating almost all articles of food which are not very hard. The condyle does not seem to be much reduced in size: when, however, the mouth is opened, as in yawning, our patient generally places her hand to support the jaw, as if fearful that it might slip out of its place. With all this amendment, however, there is pain occasionally; and as there has never been an absolute cessation of pain for more than three or four weeks at a time, the issue is still kept open."

Although from the time when I began the practice of my profession my attention has been directed to the pathology of the joints, and my opportunities of studying the subject have been very extensive, I am quite aware that the results of my observations cannot be offered to the profession as approaching to any thing like a perfect system; and that, even if it were in my power to pursue my inquiries for many years to come, there would still be much left to reward the labours of those who may be disposed to engage in similar researches.

These and all other diseases which, either in the beginning or ultimately, cause an alteration in the structure of the diseased organ, may be considered under two points of view. They may be regarded merely as an assemblage of symptoms, running a certain course; and as such they are quite proper objects of study. They may thus be recognised in the living person, and distinguished from each other; and without any further knowledge respecting them, we may be enabled to discover efficient modes of treatment leading to their cure. But they may be regarded also with a reference to their more intimate nature, and the changes which are actually going on in the living body; and here a kind of knowledge is required, which cannot be obtained without dissection and anatomical inspection of the diseased parts. The importance of morbid anatomy, in enabling us to obtain a greater insight into disease, cannot be too highly estimated. But it has

not the same value under all circumstances. The dissection of a joint, or of any other organ, in the advanced stage of a disease, when all its component parts are involved in one mass of destruction, can give us little real and useful information as to what was the original nature of the disease, or as to the particular texture in which it began; nor can it afford us the smallest help in solving the most important problem of all, namely, the means of cure. It is only from the examination of the changes produced by disease in its very commencement, or before it has made any considerable progress, that we can arrive at any satisfactory conclusion on these points. With the preliminary knowledge thus obtained, the dissections made at a later period become intelligible and useful, and without them they are of little or no value. But the joints are not vital organs; and the diseases to which they are liable being, with few exceptions, of a chronic character, the opportunities of examining the morbid appearance at an early period are of rare occurrence, and can be only accidentally obtained. I have made these remarks in order that my object may not be misunderstood in introducing in this place the following account of a somewhat peculiar affection of the shoulder. I cannot so well explain the circumstances belonging to it, as by supposing that the original disease is ulceration of the articular cartilages; but I have not had the opportunity of satisfying myself on this point by dissection; and it is therefore not impossible

that in some future edition I may have to transfer the history to another part of the volume.

The cases here referred to occur more frequently in private than in hospital practice : and (whether it be accidentally or not I do not know) it certainly has happened that I have met with it more frequently in the female than in the male sex. The patient complains of pain, which however is referred not so much to the joint itself as to the arm a little below it, near the insertion of the deltoid muscle. At first the pain is trifling, but it soon becomes severe and constant. The patient describes it as a *wearing* pain, of which she is constantly reminded. It is aggravated by every motion of the limb, and by pressing the articulating surfaces against each other. Not only is there no perceptible enlargement of the shoulder, but after some time, in consequence of the want of use and wasting of the deltoid muscle, it seems to be actually reduced in size. It is not long before the mobility of the joint is impaired, becoming gradually more and more limited. When the patient attempts to raise the elbow from her side, it is observed that the scapula is elevated at the same time with the humerus. She is unable to raise her hand to her face, nor can she rotate the limb so as to place it behind her. When the progress of the disease is stopped at an early period, the mobility of the joint may be restored ; but otherwise, although the pain and all other symptoms of the disease have sub-

sided, the joint remains stiff, and to all appearance completely ankylosed. Whatever motion the arm is capable of, under these circumstances, depends not on the humerus but on the scapula; and it is remarkable to what an extent the scapula, or rather the muscles belonging to it, will accommodate themselves to this new state of things, so as to make up for the deficient motion of the shoulder.

It certainly is seldom that this disease terminates in abscess of the joint, when proper attention has been paid to the treatment of it, nor has this happened in any case in which I have had the opportunity of closely observing its progress. I have, however, seen cases of abscess with ulceration of the cartilages, and complete destruction of the shoulder joint, in which I conclude that, if I had been consulted at an early period, I should have found the symptoms to correspond with those which I have just described.

Whether it be from this, or from any other disease, that the joint of the shoulder is brought to such an extreme state of disorganisation, one result is, that it is liable to dislocation, or, more properly, to sub-luxation in the direction forwards. In one case, in which I had the opportunity of examining the parts after death, I found the anterior margin of the glenoid cavity of the scapula destroyed by ulceration, the head of the humerus permanently resting on the ulcerated surface. In another case, in the living person, I

found the dislocation to be only occasional, the head of the bone slipping forward so as to make a visible projection in certain motions of the arm, and in certain other motions returning to its natural situation.

I may take this opportunity of noticing another circumstance, which, though not of much interest in pathology, is of some importance in practice. An abscess originating in the shoulder-joint sometimes presents a peculiar appearance, when it is making its way to the surface. A dissection, which I once had the opportunity of making, will explain at once the nature and the cause of this peculiarity. The abscess, taking the course of the tendon of the long head of the *biceps flexor cubiti* muscle, had suddenly emerged from the joint at the lower end of the bicipital groove of the humerus: then, having taken a direction forward, on the anterior edge of the deltoid muscle, had presented itself under the integuments, having a spherical form, so that it might have been mistaken for an encysted tumour. I met with one case, in which this mistake respecting an abscess of this kind was actually made by a surgeon of considerable experience, who proposed the removal of the tumour by the knife.

SECT. III.

Treatment of this Disease.

IN these as in most other cases of disease of the joints, the first question that will arise in the mind of an experienced surgeon is, whether suppuration has or has not already taken place in the articular cavity? If he be compelled to answer this question in the affirmative, there is no chance of the limb being preserved, even in the child, except after a long and tedious process of treatment, nor without complete ankylosis of the affected joint; and in the adult the probability of obtaining even this imperfect cure is so small that no one can be justified in offering any but the most unfavourable prognosis. And be it observed, that the question is not merely as to the actual existence of any considerable purulent deposit; but that a single drop of matter is always to be regarded as the nucleus of a large abscess, which will sooner or later present itself externally, in defiance of all the means that can be had recourse to to prevent it. If, on the other hand, circumstances justify the opinion that suppuration is not yet established, and a proper mode of treatment be at once begun and strictly carried out, it will be found that there are few diseases more under the control

of the surgeon than this, or in which art can be employed with more decided benefit to the patient.

The observations which I formerly made as to the necessity of preserving the joint in a state of absolute and complete repose, and of attending to the position of the limb, are equally applicable to the cases which are now under our consideration, as to those which formed the subject of the preceding chapters. It cannot be necessary for me to repeat the rules which have been already laid down for the better accomplishment of this important object. I need only observe that, unless these rules be strictly observed, there is not the smallest prospect of advantage from any other treatment.

In the early part of my practice I was accustomed to regard the ulceration of the articular cartilages as a disease which was to be relieved almost exclusively by local remedies, and that the only thing to be observed besides was, that ordinary attention should be paid to the maintenance of the patient's general health. Experience, however, has long since led me to a very different conclusion, and has satisfied me that there are remedies which, acting through the medium of the constitution, exercise a most beneficial influence over the local malady, and by the judicious application of which many cases may be brought to a favourable termination, in which this could not have been accomplished otherwise. The remarks which follow are applicable not only

to cases of ulceration of the cartilage, where it occurs as a primary disease, but also to those described in the first chapter, in which the cartilages are ulcerated as a consequence of inflammation of the synovial membrane.

In the acute form of the disease mercury may be administered with the greatest advantage; and usually it will be found, as soon as the system is thoroughly under its influence, that the pain and startings of the limb are diminished, and, if the treatment be continued, in the course of ten days or a fortnight, that they are relieved altogether. The mercury should be exhibited freely, as in a case of iritis, and so as to produce a moderate degree of soreness of the gums. Thus, two or three grains of calomel, combined with sufficient opium to prevent it from acting on the bowels, may be given three or four times daily in the first instance, the dose being reduced according to circumstances afterwards; or, if mercury taken internally should disagree with the patient, mercurial inunction may be had recourse to instead, the ointment being rubbed in, not on the limb which is the seat of the disease, but on some other part of the body. As soon as the symptoms are completely relieved, the mercurial treatment has done its duty, and may be discontinued. A short time will show whether the disease has been stopped at a sufficiently early period for the patient to regain the use of the joint, or whether the disease must terminate in ankylosis. The latter is,

if I am not mistaken, in these cases, the most frequent result.*

In those cases in which the disease assumes a more chronic form, mercury is also a most efficient remedy. It may, however, be administered in smaller doses, so as to bring the system more gradually under its influence. Calomel may be given combined with opium or with henbane; or the common mercurial (or blue) pill, or the bichloride.† The latter may be given in combination with sarsaparilla; or a mercurial pill may be given at night with two or three grains of iodide potassium in solution twice daily

* Although on a reference to the two last editions of this work (see the cases of Sarah Holder and Sarah Hansell), it will be seen that I had long since occasionally had recourse to the mercurial treatment in cases of ulceration of the articular cartilages; still I must acknowledge that I had not been in the habit of using it generally until I had read the statement published by Dr. O'Beirne, in the Dublin Medical Journal for May, 1834; and I gladly avail myself of this opportunity of expressing my obligations to that gentleman for having brought the subject more distinctly under the notice of the profession.

† The bichloride is best administered in the form of a pill, for which I generally use the following formula, which was given to me by the late Mr. Pearson:—

℞. Hydrargyri bichloridi, gr. j.

Ammoniæ muriatis, gr. iii.

Aquæ destillatæ.

Medullæ panis āā quantum sufficit.

Misce ut fiat massa, in pilulas dividenda.

From one sixteenth to one eighth of a grain may be thus administered two or three times daily; or half a grain may be given during a meal, so as to be mixed with the food.

at the same time. Sarsaparilla may also be administered alone with the greatest benefit, where for any reasons it is desirable that the use of mercury should be avoided, care being taken on this as on other occasions, that it is of the best quality, and taken in sufficient quantity.

The influence of this class of remedies, in cases of ulceration of the cartilage, is favourable to the opinion which has been already expressed, that this disease is, in some instances at least, of a rheumatic character. It may be observed, that I have not recommended the exhibition of mercury, where the cartilages are affected, as the consequence of scrofulous disease of the cancellous structure of the bones. I have no experience which could lead me to believe that it can be given with advantage in the last-mentioned cases; and there can be no doubt that the influence of it on the constitution, as a depressing agent, must in them be injurious. Practically there is little difficulty in distinguishing when mercury may or may not be properly had recourse to. If, in the early stage of the disease, that is previously to suppuration having taken place, there be severe pain, with involuntary startings of the limb, and especially if these symptoms have been preceded by rheumatic pains elsewhere, the mercurial treatment will generally be productive of the greatest benefit. If abscess be already formed it is certainly useless, and may probably be injurious.

As a general rule, the abstraction of blood from the neighbourhood of the affected joint is not to be recommended. There is no more reason to believe that blood-letting would stop the progress of ulceration in cartilage or bone, than that it would stop that of ulceration of the skin of the leg. But, as in the latter case, if the patient, by too freely using the limb has brought on inflammation of the surrounding parts, such inflammation may be relieved by the application of leeches ; so may the abstraction of blood by leeches or cupping be useful where inflammation has supervened in a case of ulcerated joint as the result of incautious movements. It is, however, only in a few instances that this is required at all ; and it need scarcely ever be repeated.

I have formerly expressed my opinions as to the inefficiency of setons, issues, and other (so-called) counter-irritants in cases of scrofulous diseases of the joints. I do not hold the same opinion respecting them in cases of ulceration of the cartilage from other causes. I have indeed no doubt that in such cases they are often useful in affording more complete relief from pain than could have been obtained otherwise, as well as in preventing suppuration. In some instances, a blister of a moderate size, and kept open by means of the savine cerate for a limited period of time, will answer the intended purpose. Where a more permanent influence of this kind is

required, an issue made with caustic is to be preferred. The caustic potash may be rubbed on the surface of the skin, or the Vienna paste may be applied, so as to produce an eschar extending to the subcutaneous texture; and when the eschar has separated, the sore may be kept open as an issue, either by dressing it with peas, in the usual way, or by rubbing the granulations once or twice in a week with the caustic potash, some lint spread with the savine cerate being applied in the intervals. The issue should be in some convenient situation in the immediate vicinity of the diseased joint. If the hip be the part affected, it may be behind the great trochanter; if it be the shoulder, it may be on the fore-part below the situation of the coracoid process; and if it be the knee, two issues of a moderate size may be made, one on each side of the patella. When the seat of the disease is in the elbow, wrist, or ankle, an issue is generally productive of much inconvenience; so that I am unwilling to recommend it, except as a matter of necessity. When there is disease in the hip, with a more than usual amount of pain, much relief is sometimes afforded by the insertion of a seton in the groin. On this point I may refer to the observations which I made when treating of the scrofulous disease of the same joint.

The actual cautery, or the moxa, may be used for the purpose of making an issue, instead of the caustic potash; but I am not aware that they possess any advantage over it, and they

have the disadvantage of being more alarming to the patient.

Before I dismiss this part of our inquiry, I must, however, confess that even in cases of primary ulceration of the cartilages I am less disposed to the employment of issues and other remedies of the same class, than I was formerly. Where abscess has already formed, they certainly are a mere useless addition to the patient's sufferings; and even when there is reason to believe that the disease has not yet advanced to suppuration, with my present experience, I seldom recommend them unless I find that the symptoms do not readily yield to other treatment, or that they are unusually severe.

The treatment of abscess in these cases does not differ from that which is required in other cases of diseased joint; and it is sufficient for me to refer to what I have said on that subject in the preceding chapters. Neither need I repeat what I have already stated as to the small chance which there is of recovery, at least in the adult, in this last stage of the disease. Certainly we are never justified in proposing the amputation of the limb, or the excision of the joint, where there is no adequate reason for believing that suppuration has taken place. Where abscess already exists, if the patient's general health be not materially affected, we may endeavour, by the application of splints, or by taking care that the contents of the abscess are enabled freely to escape, to obtain ankylosis; but the experiment

should not be obstinately continued where there is not a good prospect of its success ; it being better that the patient should lose the limb than incur the risk of losing his life while we are endeavouring to preserve it.

Even where suppuration of the joint has not taken place, if the cartilages are extensively destroyed, it is not to be expected that there will be any other recovery than that by ankylosis ; but where there has been only a partial destruction of the cartilage, the joint may retain its natural degree of mobility. And here the question will arise, what is the state of the articulating surfaces under these circumstances after the cure has taken place ?

Cases will be found recorded in other parts of this volume, in which the bony surfaces of a joint were covered by a dense membrane, formed to supply the place of the cartilage which had been destroyed ; and I cannot assert that this membrane is never ultimately converted into the true cartilaginous structure. In other instances a compact layer of bone is generated on the carious surface, nearly similar to what is seen in the healthy bone after the cartilage has been destroyed by maceration. I have occasionally, in dissection, observed a portion of the cartilage of a joint wanting, and in its place a thin layer of hard, semi-transparent substance, of a grey colour, and presenting an irregular granulated surface. It is probable that in these cases also the original disease had been ulceration of the

cartilages. The following case affords an example of another change which is sometimes met with where the cartilages have disappeared.

CASE XLVII.

A woman, thirty-six years of age, was admitted into St. George's Hospital, with pain in the hip and knee on one side. The nates were wasted and flattened, and a large abscess had burst, leaving a sinus communicating with the hip-joint. She was affected with hectic fever, and gradually sunk and died.

On inspecting the body, various sinuses were found in the neighbourhood of the hip, and communicating with it.

The synovial membrane and capsular ligament had undergone no alteration in their appearance beyond that which evidently depended on the abscess. The cartilage had been every where absorbed from the articulating surfaces, and in its place there was a thin crust of bony matter of a compact texture, of a white colour, not very unlike polished marble in appearance.

CHAP. VI.

NECROSIS OF JOINTS.

CASE XLVIII.

JOHN CURTIS, fifteen years of age, was admitted into St. George's Hospital on the 11th of October, 1837. He complained of pain in the right knee, in which, however, there were no other signs of disease. He also complained of pain in the right hip, which was increased when the articulating surfaces were pressed against each other. When the thigh was raised, it was observed that the pelvis moved with it. He was apparently of a delicate constitution, with light blue eyes and light hair.

He was directed to remain in bed, and take some preparation of iron. The symptoms, however, were not relieved, and indeed became aggravated by the addition of painful startings of the limb. A bandage was applied round the thigh, above the condyles, having a cord attached to it, which passed over a pulley at the foot of the bed, and had a light weight attached to its other extremity. The object of this was to keep the articulating surfaces of the hip from being pressed against each other, and it fully answered the in-

tended purpose, the patient being entirely relieved from pain.

January 13. 1838. The boy was in the following condition. When the limb was rotated inwards, he complained of what he called a shooting pain in the knee and foot. There was no starting of the limb. There was a swelling with evident fluctuation of fluid in the neighbourhood of the hip. The tongue was clean, and the appetite good.

March 26. 1838. A large abscess was opened on the external and upper part of the thigh, which continued to discharge matter.

April 21. He had an attack of erysipelas, which extended from the hip downwards on the thigh, and upwards on the back, preceded by a rigor, and attended with much constitutional disturbance. The erysipelas subsided, but left him in a weak condition, with a cough and other symptoms of pulmonary disease. On the 16th of May he died.

On examining the body a large abscess was found occupying the parts in the neighbourhood of the hip, and communicating with the joint. The cartilages of the hip had entirely disappeared. The bones were extensively carious, the head of the femur being much reduced in size, and the acetabulum wider than natural, in consequence of the destruction of its bony margin. A portion of bone was dead, and having been separated from the living bone lay loose in the articular cavity. On sawing through the re-

mains of the head and the neck of the femur, the bone was found to be apparently less vascular than natural, with yellow cheesy matter in its cancelli.

The foregoing case affords an example of a fact to which I have formerly referred. Where the bones of a joint are in a state of ulceration or caries, it sometimes happens that a portion of such carious bone loses its vitality, and is separated by the usual process of exfoliation, forming what has been called a *sequestrum* in the articular cavity. This may happen whatever the cause of the caries may be. But it is more common in cases of the scrofulous caries than it is in others, probably on account of the lower degree of vitality belonging to the bone in these cases. It is also more common where scrofulous disease affects the joints of the carpus and tarsus, than where it affects the larger articulations. But it is well known that inflammation of bone, which was not previously in a state of caries, or otherwise diseased, may terminate in the death of the bone; and hence necrosis of a joint may be the result of simple inflammation of the epiphysis of one of the bones of which it is composed. In the limb of a patient which was amputated in St. George's Hospital, I found on dissection the whole of the upper epiphysis of the tibia dead, and in a state

of exfoliation, the knee-joint being destroyed in consequence.

In the following case the same thing had occurred in the epiphysis of the lower extremity of the tibia.

CASE XLIX.

George Chessall, twenty-two years of age, was admitted into St. George's Hospital on the 28th of October, 1829.

There was a hard swelling in the situation of the lower extremity of one tibia, with considerable redness of the foot and ankle. He experienced great pain in the part, especially at night, when he was frequently roused from his sleep by a sudden and painful starting of the limb. The ankle admitted of the usual motions; and it did not appear that the pain was aggravated by the friction of the articulating surfaces against each other.

The patient stated that eight months ago he had suddenly experienced a violent pain referred to the tibia immediately above the ankle joint. The pain continued to be very severe during the night, but abated on the following day. He had frequent returns of pain afterwards; and the foot and ankle became swollen.

November 10. He had a rigor attended with head-ache and vomiting, and followed by a slight degree of fever.

December 25. An abscess broke immediately above the ankle. A probe introduced into the abscess came in contact with exposed bone.

January 8. 1830. The synovial membrane of the ankle being much distended with fluid, an opening was made into it, through which a considerable quantity of thick pus was discharged.

January 14. The leg was amputated.

On dissection, the synovial membrane of the ankle was found to be thickened, its inner surface being encrusted with lymph resembling that which forms the lining of a common abscess. There was a small quantity of pus in the joint. The cartilages had completely disappeared.

In the centre of the articulating surface of the tibia, a portion of bone, measuring about three-fourths of an inch in its widest, and half an inch in its narrowest diameter, was dead, but still continuous at its margin with the living bone. On making a longitudinal section of the tibia, it was ascertained that the dead bone just mentioned was the base of a sequestrum of a conical shape, nearly two inches in length, which projected into a cavity in the centre of the tibia, containing pus, the exfoliation of the dead bone being complete everywhere except at the lower part.

The death of the whole or of a portion of the articulating extremity of a bone must necessarily cause the immediate destruction of the entire joint. The death of a portion of bone, however small, in the interior of an epiphysis, may, not indeed immediately, but will ultimately, produce the same result. A lady of a delicate habit of body, in walking down a hill suddenly experienced a severe pain in the situation of the ankle joint. This was followed by inflammation and abscesses; but not having seen the patient at the time, I am unacquainted with the particulars of the case. In December, 1822, I was consulted respecting her, with Mr. Poyser of Wirksworth; and we agreed in recommending the amputation of the leg. On dissection, after the operation, we found the ankle joint with abscesses communicating with it, and the cartilaginous surfaces completely destroyed. But the original disease seemed to have been in the centre of the astragalus, where a piece of dead bone, of the size of a horse-bean, lay loose in an ulcerated bony cavity. From this cavity a narrow sinus extended upwards to the superior articulating surface, and communicated with the ankle joint, by which it was plain that the pus secreted in the ulcerated cavity of the astragalus must have found its way into the articular cavity.

The following is a somewhat more extended history of a case of the same kind.

CASE L.

James Goodyer, nine years of age, was admitted into St. George's Hospital on the 8th of April, 1814.

One knee was much enlarged, and painful. An abscess presented itself on the anterior lower part of the thigh immediately above the joint. The joint was tender when handled. The leg was partially bent on the thigh.

It was said that he had met with an injury of the knee seven years ago, and that from that time the joint had not appeared to be quite in a sound state, but that he had not suffered much from it until within the last four or five weeks, when the knee became suddenly swollen, with evident pain, so that it was necessary that he should be confined to his bed.

April 20. An abscess burst on the inside of the knee; and this was followed by some relief from pain.

June 27. Another abscess burst, also on the inside of the knee. Various modes of treatment were tried without any obvious advantage. Sometimes it was supposed that he suffered less; at other times he seemed to suffer more. In the following autumn the limb was amputated.

On dissection of the diseased joint, it was found that the inferior extremity of the femur was much increased in size, in consequence of the deposition of new bone on its external surface.

On making a section of the femur above the condyles, a cavity was found in the middle of the bone, in which lay a loose piece of dead bone, of the size of a small walnut. A sinus extended from this cavity downwards into that of the knee joint, communicating with the latter by an opening in the space between the two condyles. There were other sinuses extending from the cavity in the centre of the femur, outwards to the surface of that bone, and communicating with the external abscesses.

Except where the seat of the disease is in the hip or shoulder, necrosis of the articulating extremity of a bone is for the most part easily ascertained, as a probe introduced by one of the sinuses comes plainly in contact with the surface of the dead bone. Circumstances, indeed, may arise, preventing an exact diagnosis; but this is of the less importance, as the condition of the joint otherwise is generally such as to preclude all reasonable expectation of the limb being preserved. The rule is, that in a case of this kind, if the joint be one that admits of being removed by amputation, and the nature of the disease can be clearly ascertained, the patient should be at once advised to submit to the operation; and indeed the only exceptions to the rule are, where the articulating extremities of the phalanges of the toes or fingers, or the heads of the metatarsal or

metacarpal bones, are affected in this manner. Here, the joints being superficially situated, the ultimate exfoliation of the dead bone is more easily accomplished. The principal difference, however, is this, that, the joints of the toes and fingers being of a smaller size, diseases of them may exist to a great extent without affecting the general health ; and that we have, therefore, ample time afforded to us for bringing the disease to a favourable termination ; which we have not, when it is situated in the larger articulations. Much, however, must here depend on the situation of the patient in other respects, and something on the joint in which the disease is situated. In private practice, among the more affluent classes of society, a great deal may be accomplished which cannot be accomplished in hospital practice, or among the poorer classes : and, with persons of all conditions, it may be worth while to submit to a very long-continued inconvenience for the sake of preserving a great toe or a thumb, when it would be otherwise, if the question were about the retaining or losing a little toe or a little finger.

Every practical surgeon is aware how common an occurrence necrosis is in what are called scrofulous children. A slight swelling is perceptible over a bone, which increases, and proves to be an abscess. When the abscess has been opened, or has burst spontaneously, a probe introduced into it comes in contact with a portion of dead bone, which is slowly undergoing the process of exfo-

liation. This may happen in any part of the body ; and it sometimes happens in the articulating extremities of the bones which I have just mentioned, that is, of the toes or fingers. In such cases the treatment required is very simple ; and, where time can be afforded for the cure, it is very effectual. Great attention should be paid to the improvement or maintenance of the general health, and the affected parts should be supported by a stiff leathern splint, so as to keep them in a state of absolute immobility. The mode of applying the splint depends on circumstances. Sometimes it is sufficient to support a part of the hand or a part of the foot ; at other times the whole foot or the whole hand must be supported in this manner. Of course the hand is thus rendered useless as long as the splint is worn ; but if a splint be nicely adjusted to the foot, and the patient wears over it a cloth boot with a leathern sole, made to be laced in front, no harm will arise from his taking exercise by walking ; while it will be productive of great good, as nothing will contribute more than this to the preservation of the general health. If for any reason it should be found that the foot, even thus protected, will not bear the weight of the body, the patient may be provided with a common wooden support, such as is worn after amputation of the leg below the knee. I am aware that what has now been stated, is no more than what has been stated in a former chapter, when the treat-

ment of the scrofulous disease of the joints was under our consideration; but the subject is one of such very great practical importance, that I do not offer any apology for the repetition.

The effect of the application of splints, in these cases of necrosis of the fingers and toes, is sometimes very remarkable. I have seen a child with several fingers enlarged, and variously distorted, and suffering pain on the slightest motion of the hand; in whom, immediately on the splint being applied, all pain has ceased, and in the course of a few weeks the affected parts have become reduced to their natural size, and have, in a great degree, regained their natural appearance. I have no reason to believe that, where the articulating extremity of the bone has lost its vitality, there is ever any reproduction of bone to supply the place of that which has been separated by exfoliation: and hence it is that if a finger or toe recovers from this disease, it is always shorter than natural. The bone, which remains, however, does not always lose its mobility. A young lady had a disease in the joint of the great toe with the metatarsal bone, there being necrosis of the base of the first phalanx. A splint was applied, and after a very considerable time a portion of dead bone was removed by the forceps, which was found to include the articulating surface. I advised her to continue to wear the splint, presuming that ankylosis would take place. No such result, however, ensued. The toe was considerably

shortened; but whether it was that some kind of new joint was formed, or that there was a production of ligament, which answered something like the purpose of a joint, I will not venture to say; but from one or the other of these causes the toe was still moveable on the metatarsal bone, and nearly as useful as before, enabling the patient to walk and dance without the smallest inconvenience.

In those cases in which the joint is affected in consequence of a portion of dead bone being pent up in a cavity in the articular extremity of the living bone, it is for the most part impossible for the most careful observer to understand the exact nature of the disease, until the death of the patient, or the amputation of the limb, enables him to ascertain it by dissection. Under certain circumstances, however, this difficulty as to diagnosis does not exist; and a simple operation may then be performed with a great probability of a favourable result.

CASE LI.

W. Kendrow was admitted into St. George's Hospital on the 4th of February, 1837.

The knee joint was slightly enlarged.

There was a sinus in the anterior part of the

head of the tibia, a little below the joint, through which a probe could be passed into the centre of the epiphysis, where it came in contact with a portion of dead bone, apparently loose in the cavity in which it was contained. The motions of the knee were unimpaired.

From the history which the patient gave, it appeared that about a year ago he had suffered from a severe attack of inflammation of the head of the tibia, and that some time afterwards an abscess burst in front of the leg, leaving the sinus which has been just mentioned. There had been two or three attacks of inflammation in the interval which had elapsed between the first attack and the time of the patient coming to the hospital.

March 2. — Having exposed the head of the tibia I applied a trephine so as to enlarge the sinus which led to the interior of the bone. At the bottom of this sinus, lay a detached piece of dead bone of the size of a horse-bean, but of a very irregular shape. This was extracted without difficulty.

A few days after the operation the patient had an attack of rigor and vomiting, which was followed by a severe attack of erysipelas, of which he ultimately died.

On examining the limb it was found that the whole of the upper extremity of the tibia was increased in size and density, there being a deposit of rough scabrous bone on many parts of its external surface.

The cavity from which the dead bone had been extracted was of sufficient size to contain a large cherry, presenting a tolerably regular concave surface, but without any consolidation of the cancellous structure. This cavity communicated with the knee joint in front of the spine of the tibia by a narrow aperture. The cartilage covering the head of the tibia was in many parts completely absorbed, leaving the surface of the bone exposed, but not in a state of caries. In other parts the cartilage was converted into a substance bearing some resemblance to condensed cellular membrane; and in a few places a narrow stripe of cartilage remained, not altered from its natural condition. In some parts the bone, where it was apparently exposed, was found, on a close examination, to be covered by a very thin semi-transparent membrane. There was no pus in the joint.

Although the head of the tibia was hard and dense, the condyles of the femur seemed to contain less earthy matter than under ordinary circumstances. The cartilage covering them was easily peeled off, and some portions of it were so thin, that the colour of the bone could be seen through them.

There is no evident reason why, if he had not been unfortunately cut off by the attack of erysipelas, this patient should not have recovered, retaining an useful joint.

CHAP. VII.

CHRONIC DISEASE OF THE JOINTS CONNECTED WITH
GOUT AND RHEUMATIC GOUT.

SECTION I.*Pathological Observations.*

IN the first chapter of this work I have stated that inflammation of the synovial membranes, as it presents itself under ordinary circumstances, may not unfrequently be traced to a gouty diathesis. It is so in numerous instances, in which, nevertheless, neither the patient nor his medical attendant, would admit that there had ever been what is called "a fit of the gout." I have referred to rheumatism as a cause of inflammation of the synovial membranes in other cases, and I have also adverted to a peculiar disease of a very chronic character, which is generally supposed to bear some relation to both gout and rheumatism, and treated of under the name of rheumatic gout. In this disease inflammation of the synovial membrane is the first of a series of changes which the joint undergoes, and which

in the course of years ends in its entire disorganization. I propose to give some account of these changes, of the symptoms by which they are indicated in the living persons, and of the treatment which the disease requires, in the present chapter.

CASE LII.

A woman who for many years had suffered from rheumatism, affecting especially the knees, was admitted into St. George's Hospital under the care of Dr. Chambers, on account of a pulmonary disease, from the effects of which she died.

On examining the body after death, the synovial membrane of the right knee was found to be dilated, much thickened, and preternaturally vascular, the inner surface of it being lined by a great number of excrescences, somewhat resembling in appearance the *appendices epiploicæ* of the great intestine, but of a smaller size. These presented a smooth membranous surface externally, but on being cut into were found to consist of condensed cellular membrane and fat. The cartilage of the external condyle of the femur had wholly disappeared, and in its place a solid bony matter had been deposited, not unlike ivory in colour and consistence. The bone at this part had a grooved appearance, as if worn by the friction of the patella. The car-

tilage of the inner condyle was altered in structure, being softer than natural, at the same time that it presented an indented or corrugated appearance on its surface. The patella was wholly deprived of cartilage, the exposed surface of the bone being of a hard and compact texture, and exhibiting distinct indications of its having been worn by friction on the external condyle of the femur.

The left knee was diseased nearly in the same manner as the right, and both knees were much enlarged, the enlargement being the result partly of the thickened condition of the synovial membranes, partly of an opaque serum collected in the articular cavities.*

CASE LIII.

An old lady who had suffered in an unusual degree from gout, for a great part of her life, was supposed at last to labour under an organic disease of the stomach. She died on the 20th of December, 1812, and I was requested to examine the body.

Externally it was observed that several joints of the fingers were ankylosed, the fingers themselves being variously distorted. The middle

* This case has been formerly referred to, as affording an example of an altered structure of the synovial membrane, consequent on chronic inflammation.

finger of the left hand was shortened, and the skin over it was loose. The bone of the second phalanx appeared to have been nearly absorbed, so that there were scarcely any remains of it; and only a small quantity of soft substance in its place. The right wrist and elbow were ankylosed, as were also several of the joints of the toes. The knees admitted of incomplete flexion and extension; and the motion of the joints was attended with a grating sensation.

In various parts of the body there were orifices in the skin communicating with membranous cysts, situated in the adipose substance, and discharging a chalky fluid.

On dissection it was ascertained that the *pleura pulmonalis* and *pleura costalis* were universally adhering. The peritoneal surfaces of the stomach, spleen, liver, and gall bladder adhered universally to each other and to the contiguous parts. There were no other preternatural appearances in the thorax and abdomen.

There were no remains of the cartilages in the left knee. The corresponding parts of the patella and condyles of the femur had the appearance of having been worn into grooves and ridges, as if from their friction on each other: presenting, however, a compact surface, the cancellous structure not being exposed, as would have been the case if friction had been carried to the same extent in the dead body. A thin layer of white, chalk-like matter had been deposited on the bones, where the cartilages had disappeared,

in several places. On the margin of the articulating surfaces were several small exostoses. The ligaments and synovial membrane were little altered from their natural state; with this exception, that the thin layer of the latter, which is extended over the cartilages, had disappeared with the cartilages themselves. In the right wrist the first row of the carpal bones were ankylosed to each other and to the radius.

The other joints were not examined.

In the pathological museum of St. George's Hospital there is a preparation exhibiting the condyles of the femur encrusted with a gouty concretion (lithate of soda), taken from a patient, of whose case the following is a brief history.

CASE LIV.

A man, fifty-two years of age, was admitted into the hospital who had long laboured under a disease which had been considered as rheumatic gout. Some time after his admission he was seized with erysipelas of the head, followed by diffuse inflammation of the submucous laryngeal cellular tissue, of which he died.

On examining one of the knee joints, the synovial membrane was found much thickened and vascular. The cavity of the synovial mem-

brane was filled by a large quantity of a thick white fluid, which proved to be a mixture of lithate of soda and pus. In some parts the cartilages had disappeared, and the exposed surface of bone was covered by a thin layer of the lithate of soda. Where the cartilages remained they were encrusted in the same manner. There were deposits of the same gouty concretion in cysts of the cellular membrane external to the joint.

In the museum of St. George's Hospital there are many other specimens of joints similarly diseased. From these we learn that the lithate of soda is deposited in a variety of textures:—underneath the synovial membrane, on the bone near the margin of the cartilage; on the surface and in the substance of the cartilage; in the cancelli of the bone, and in the cellular tissue external to the joint. In one preparation of the patella, taken from a gouty subject, the cartilage is seen increased in thickness, and presenting a striated appearance, the striæ being at right angles to the articulating surface. In this case the cartilage is described in the catalogue as having been “in its recent state softer and more yielding than natural, and having a tendency to break up into fibres.”

Although the opportunities of examining the pathological condition of joints which are affected in this manner are only of occasional occurrence,

there is no surgeon of much experience who has not seen many cases of the same disease in the living person, or who, having seen them, will not assent to the correctness of the observation which I have already made, that inflammation of the synovial membrane is the first of the series of changes which the joint undergoes. This is clearly indicated by the symptoms. The deposit of lithate of soda takes place only as the disease advances, and though it is a very frequent, it is not a constant, occurrence. The absence of this deposit is not a proof of the absence of the gouty diathesis. An elderly gentleman was attended by Dr. Chambers and myself, labouring under well-marked symptoms of gouty disease. One of the effects produced was a chronic inflammation of the synovial membrane of one knee. The membrane was considerably thickened, and contained fluid. He had been in this state, sometimes better, sometimes worse, for some years. When living at his house in Scotland, he was seized with symptoms of acute phrenitis, of which he died. The body was examined by his medical attendant, Mr. Johnstone, who found the diseased joint distended with a dark-coloured glairy fluid, and the cartilages absorbed, but without any white incrustation.

Indeed, in cases of gout generally, it is difficult to discover any rule by which the deposit of lithate of soda is regulated. One person has his fingers and toes distorted by gouty concretions, at the same time that deposits of the same kind

are found in the larger joints, and in the subcutaneous cellular tissue in various parts of the body; while another person, who has been equally tormented by the gout with the former, is altogether free from this additional cause of distress. Probably much depends on the greater or less prevalence of soda in the system, the lithate of soda being an insoluble salt, and in this respect differing from the combinations of the lithic acid with the other alkalies. There is great reason to believe that many of those who are troubled with what are commonly called chalk-stones have much aggravated, if they have not actually produced, the evil, by taking large quantities of soda for the purpose of correcting acidity of the stomach.

The process by which the absorption of the harder textures takes place in these cases is manifestly very different from ulceration, and is altogether very remarkable. The cartilages disappear, so that the bones are exposed; but the latter present nothing corresponding to the appearance of a carious surface. They bear evident marks of having been subjected to the influence of friction, appearing as if portions of their surface had been scraped off by a chisel. This is especially observable in the knee, where the motions of the joint are only in one direction and less observable in the hip, where the motions are more various. But the results of friction on the living are very different from what they would be in the dead bone. There is no ex-

posure of the cancellous structure; a process of repair goes on simultaneously with that of destruction, and the consequence is the formation of a hard and compact layer of bone, bearing no small resemblance to ivory, covering the cancellous structure, which must have been exposed otherwise.

In one of the cases which have been just described, it was found that some new formations of bone, in the shape of small exostoses, had taken place at the margin of the articulating surfaces. I shall have occasion hereafter to refer to two other cases, in each of which portions of such newly formed bone had been broken off by the motion of the joint, and become loose bodies in the articular cavity. In other cases masses of new bone are laid on in one part, while the original bone is removed by absorption in another, so as completely to alter the form and character of the articulating surfaces.

SECT. II.

On the Symptoms of this Disease.

THE individuals who are most liable to be thus affected by rheumatic gout are those who have not been accustomed to much bodily exercise, and have at the same time led luxurious lives. I suspect that too great an indulgence in the use of animal food is even more likely to produce it than the free use of fermented or spirituous liquors; and that it is for this reason that it is frequently met with among porters and the upper servants of wealthy families.

The disease is rarely confined to a single joint, and in most instances several joints are affected in succession. Often it shows itself in the first instance in a joint of one of the fingers, which is observed to be slightly enlarged and stiff, with an occasional twinge of pain in it. Then, one after the other, other joints of the fingers are affected in the same manner. It was to this enlargement of the joints of the fingers that Dr. Haygarth gave the name of *nodosities*. The immediate cause of it seems to be a thickening of the synovial membrane, and probably in part an effusion of serum into its cavity. Afterwards the disease extends to the other and larger joints, sometimes to a greater, sometimes to a

smaller number in succession. In those joints which are superficially situated, so as to admit of examination, fluid may be detected, the quantity of which, however, varies accordingly as the limb is exercised or kept quiet, and is seldom very large. The fluid is more perceptible in the first instance than it is afterwards, on account of the synovial membrane becoming thickened.

The progress of the disease is generally very slow, so that many years may elapse before it reaches what may be regarded as its most advanced stage. Throughout the whole of its course it causes no severe pain; but there are constant uneasy sensations, and much distress and inconvenience, in consequence of the joints becoming gradually more rigid and unfit for use. The patient, in addition to his local ailments, always suffers, in a greater or less degree, from the usual effects of dyspepsia, which are aggravated by want of exercise. He is liable to acidity of the stomach and flatulence after his meals; is nervous and irritable; and every error as to diet, as well as all mental excitement, will produce an aggravation of both the constitutional and local symptoms.

In a few instances, after having reached a certain point, the disease becomes stationary, or there may be apparently some degree of improvement. But, except where it was treated in the very earliest stage, I do not recollect any one case in which there was anything approaching to a cure. In the majority of cases the

disease is progressive, the joints becoming more and more disorganised, sometimes with little, at other times with much, increase in size. That increase in this stage of the disease depends not merely on the causes already mentioned, but also on a deposit of new bone in the neighbourhood, and sometimes on that of a gouty concretion in the surrounding cellular tissue. Ankylosis sometimes takes place as an ultimate result. There is little tendency to suppuration. I cannot say that abscess never forms; for I suppose that there are no morbid changes of any kind in the course of which this may not possibly occur; and indeed, in one of the cases which I have just recorded, it was believed that there were pus-globules mixed with the semifluid substance which the joint contained. But the formation of abscess in these cases certainly does not belong to the regular order of events, and must be regarded as a rare exception to the general rule. This is a remarkable circumstance in the history of the disease, and forms an important difference between it and the ordinary diseases to which the joints are liable.

Distressing as such a malady must always be, harassing the patient, as it does, year after year, with no prospect of a cure, still it is an evil varying very much in degree in different instances. In one individual a few joints only are affected, and these not to such an extent as to prevent him from taking a certain amount of exercise, and enjoying the advantages of social intercourse;

in another scarcely one joint of the extremities remains in a sound state: some are completely ankylosed, and others are so stiff as to be nearly useless. Nevertheless the patient thus afflicted, a cripple, dependent on others for the means of locomotion, may live for years, reconciled to calamities which have gradually come upon him, and in the possession of a certain amount of comfort amid all his sufferings.

SECT. III.

On the Treatment of this Disease.

IN the very commencement of this disease, before any actual disorganisation has taken place, and while the joints affected are limited in number, I believe that much may be done towards preventing its further progress. The patient should be placed on a careful system of diet, partaking very moderately of animal food, avoiding fruits, acids, raw vegetables, and sugar, and taking little or no fermented or spirituous liquors. He should take exercise daily, so as to induce perspiration; and if this cannot be readily accomplished, he may with great advantage once in a week or fortnight make use of the hot-air bath. In addition to such careful management of himself, he may from time to time take alterative doses of the acetic extract of colchicum, combined with a small quantity of the mercurial pill, and occasional purgatives. Moderate doses of potash or magnesia may be given three or four hours after each of his principal meals, so as to neutralise any superabundant acid in the stomach. Soda should be carefully avoided, as tending, by its combination with the lithic acid, to form gouty concretions.

According to circumstances, however, the treatment may be varied. Thus when the patient

is depressed, as sometimes happens by the use of colchicum, the mixture, composed of rhubarb, magnesia, and ginger, sold under the name of "Dr. Gregory's Powder," may be taken every night, with an active aperient at stated intervals; and very great benefit will often be obtained from a very long perseverance in the use of these simple remedies.

Little is to be done by local applications. If, however, there be more than usual pain in a joint, leeches may be applied, and on particular occasions a bandage, not for the purpose of making pressure, but of limiting motion. In some instances a light leathern splint, or pair of splints, may be employed with advantage.

When the disease is fully established, the same kind of treatment will be useful in mitigating its symptoms, and sometimes in retarding its progress. But here the more active remedies, such as mercury and colchicum, must be reserved for special occasions. The iodide of potassium has the reputation of being useful in cases of this description; and I believe that its reputation is not wholly undeserved. It should be given only in small doses of two or three grains twice daily, but taken, if it agrees with the patient, for several weeks at a time.

But, after all, no general rule can be laid down as a guide for the practitioner on all occasions. Each individual case forms a study in itself, not only for the medical attendant, but for the patient also.

In one case, in which the patient was afflicted with this disease in a very aggravated form (so many joints being affected, that she lay almost helpless on a sofa, and various methods of treatment having been already employed to no purpose), having learned that cod-liver oil had been formerly supposed to be useful in some forms of rheumatism, I was tempted to prescribe this remedy for her. The purified oil was administered internally, and at the same time rubbed in as a liniment on the affected joints. It was a mere experiment; but there is certainly great reason to believe that it was not altogether unsuccessful. Not only did the disease cease to make progress, but, when I last saw the patient, after she had taken and rubbed in the oil, with occasional intermissions, during a period of seven or eight months, there was a distinct and manifest improvement as to all the symptoms. Indeed the result was such, that to any other patient, under the same combination of circumstances, I shall certainly be disposed to recommend a trial of the same remedy.

In the sixth volume of the Dublin Journal of Medical Science, Dr. Smith, of Dublin, has given an account of a disease of the hip-joint, under the name of *morbus coxæ senilis*. It has been since described by Mr. Adams, and again by Dr. Smith (in a volume full of interesting

practical observations), under the name of *chronic rheumatic arthritis* of the hip joint. Now on comparing the cases adduced by Dr. Smith with those which have occurred under my own observation, I can come to no other conclusion than that the disease which he has so graphically described, belongs to the same class with those which form the subject of the present chapter*; and that, if the opportunity had occurred of examining the morbid appearances in the very beginning of the disease, he would have found them limited to the synovial membrane. That a disease, apparently so simple in its origin, should ultimately cause such vast and peculiar changes in the structure of a joint, can be deemed in no wise remarkable, if we consider how, in other cases, one diseased action leads on to another, and how diseased actions of all kinds are modified as to the effects which they produce by peculiarities of health and constitution.

* At the same time I am by no means satisfied that this remark can properly be applied to all the cases which are represented by the drawings with which Dr. Smith's volume is illustrated. Some of the *femora* which are there represented have a similar appearance to what I have repeatedly observed in long-standing cases of ulceration of the cartilages and scrofulous diseases of the hip, with the particulars of which I had been acquainted during the lives of the patients.

CHAP. VIII.

ON LOOSE CARTILAGES AND EXCRESCENCES IN THE
CAVITIES OF JOINTS.

IN a former chapter I have described certain excrescences from the inner surface of the synovial, which appear to be the result of long-continued inflammation. There are other excrescences, which cannot be traced to inflammatory action, and which at the same time are no more of a malignant nature than the common polypi of the nose or uterus: and of these I propose to give some account in the present chapter.

A patient complains that occasionally in walking he is seized with a sudden pain in the knee, the leg at the same time being fixed at a particular angle. With more or less difficulty he contrives to regain the mobility of the leg; and when he has done so he discovers a hard solid body lying generally by the side of the patella, on one of the condyles of the femur: or perhaps this solid body is not detected at the time, but accidentally discovered afterwards. There can be no doubt that in such a case the symptoms are best explained by supposing that the solid body in question is movable in the joint, and that it occasionally slips in between the articulating sur-

faces. If a surgeon makes an incision into the joint, and extracts the movable body, he finds it to present externally all the appearances of cartilage, being smooth on its surface, flattened, and of an irregular form otherwise. If it be of a small size, on being cut into it is found to be cartilaginous throughout. But if it be larger (of the size of a garden bean, for example) there is always a deposit of earthy matter (phosphate of lime) in the centre: and if under these last-mentioned circumstances it be dried, the shrinking of the cartilage causes it to have the appearance of an irregularly shaped bone.

Such loose cartilages in the joints, but more especially in the knee-joints, are not uncommon; and the question arises—how are they produced? Some have even supposed that they have a kind of independent existence, bearing some relation to hydatids or other parasitic animals. The researches of pathology, however, contradict this hypothesis. A cartilage of this kind is originally formed in connection with the synovial membrane. As it increases in size, it projects into the cavity of the joint, but is still attached to the synovial membrane by a membranous band, which is continuous at one extremity with the synovial membrane itself, and reflected over the newly formed body at the other. After some time, the membranous attachment having become elongated, and the cartilage having attained a larger size, the former gives way, and the latter becomes a loose body, slipping from one part of

the joint to another, and interfering with its motions. Sometimes there is only one of these loose bodies in a joint, but frequently there are two or more, and occasionally they are still more numerous.

These remarkable formations are not peculiar to the joints. They are met with, though more rarely, in the tunica vaginalis of the testicle, in the pericardium, in the pleura, and in the peritonæum. The only serous membrane in which (as far as I know) they never occur is the tunica arachnoides. The structure and formations of the serous are so analogous to those of the synovial membranes, that it can be no matter of surprise that they should, to a considerable extent, be liable to similar diseases.

In a preparation in the Pathological Museum of St. George's Hospital, these substances are seen in the various stages of their progress. There are seven of them in all. Some are attached to the synovial membrane covering the crucial ligaments; others are situated elsewhere. The smaller ones are seen to have been developed on the external surface of the synovial membrane, in contact with the subsynovial cellular tissue. Those of a larger size project into the cavity of the joint, but are still attached to its inner surface by membranous bands. The largest of all contain bony matter in the centre; the others are cartilaginous throughout.

A loose cartilage may exist in a joint without causing much inconvenience. So it is when it is

permanently situated near the inner or outer condyle of the femur, and does not slip in between the articulating surfaces. In other cases, when the patient is walking, he is seized quite unawares by a pain in the knee, more or less severe. The leg becomes fixed at a particular angle, so that he is unable to proceed further. Generally he discovers some method by which he is enabled himself to dislodge the cartilage from the place into which it has slipped. This is done by certain movements of the leg, and by percussion of both sides or one side of the joint. But even then the accident is often followed by inflammation of the synovial membrane, which may continue for several days, or sometimes for three or four weeks.

Nor is this the whole extent of the evil. Ultimately, where the loose bodies have long existed, the articular cartilages are found in spots to have degenerated into the fibrous structure, which has been formerly described: while in other parts they are entirely absorbed. In one case, in which I had the opportunity of examining the parts by dissection, besides some loose cartilages having the usual appearance, I found another loose body of an irregular shape, with one surface smooth and cartilaginous, and the other surface having a thin layer of bone adhering to it, being evidently a portion of the articular surface actually broken off from the head of the tibia. That such an accident should occasionally happen, from any sudden and violent motion of the joint,

with a hard body loose in its cavity, is no more than might reasonably be expected.

It has been already stated, that in some instances a loose cartilage may exist in a joint, causing little or no inconvenience. Still even here the patient is never safe. It may quit the situation in which it is lodged (perhaps in consequence of the breaking of the membranous band, by which it remained attached to the synovial membrane), and then all at once he may begin to suffer. As a matter of precaution, it is always advisable that a bandage should be worn, which will have the effect of limiting the motions of the joint, and which may possibly do even more than this by causing the loose cartilage to become permanently fixed in some part of the joint where it cannot interfere with its motions. The bandage described formerly, at page 55., is a very convenient one for these purposes.

If the bandage should not give the desired relief, and the patient suffers much inconvenience from the complaint, there is no remedy but the removal of the cartilage or cartilages by an incision into the joint.

My own experience is in favour of this operation, provided that it be done in a cautious and prudent manner. The patient should be kept in a state of the most perfect quietude for two or three days preceding, and for several days after, the operation. The cartilage having been well fixed, the different parts over it should be slowly and separately divided until it is exposed. The

wound of the synovial membrane may be dilated by means of a probe-pointed bistoury, until it is of sufficient size to allow of the cartilage being extracted with a tenaculum; and the cut edges of the skin should be instantly replaced in exact contact with each other, and secured by means of adhesive plaster. There should be no searching for the cartilage in the joint. If it should slip out of the way, the wound should be immediately closed, and the limb should be laid upon a splint, until the cut edges are firmly united, — the completion of the operation being postponed to a future opportunity.

I attended a gentleman who laboured under this troublesome disease, and in whom the loose bodies not unfrequently slipped between the articulating surfaces of the knee, occasioning an almost immediate swelling of the joint, with the most excruciating pain and tenderness, and much symptomatic fever. In one instance more than a month elapsed before these symptoms had subsided. These circumstances are noticed, because they prove that, in this patient, there was a considerable disposition to inflammation; yet, by attending to the precautions above mentioned, as many as five loose cartilages were extracted by three different operations, without the slightest inconvenience arising from any one of them.

I was consulted concerning a case in which Mr. Liston, with my concurrence, removed two large loose cartilages from a gentleman's knee, by a subcutaneous operation puncturing the

skin, and then making a free division of the fascia and synovial membrane with a narrow bistoury, similar to that which is used in the subcutaneous division of tendons. The operation in this instance was perfectly successful. My own experience, however, does not enable me to determine whether it has or has not any advantage over that which is commonly performed.

I have seen two cases in which loose bodies existed in a joint, which were of a different nature, and had a different origin, from those which are commonly met with. In cases in which a joint has been long the seat of disease (especially of that which I have described under the name of rheumatic gout), it occasionally happens that a bony ridge is formed, like a small exostosis, round the margin of the articular surfaces. In the two cases to which I allude, this preternatural growth of bone had taken place, and, in consequence of the motion of the parts on each other, portions of it had been broken off, and lay loose in the cavity of the joint.

The two following cases are examples of fleshy tumours growing from the inner surface of the synovial membrane, and successfully removed by an operation. They are the only cases of the

kind which have come under my observation, and therefore contain all the knowledge which I possess on the subject. Of the first of these patients I have heard nothing since he quitted the hospital. The second has never had any return of the disease in the twenty-seven years which have elapsed since the operation was performed

CASE LV.

Morris Sudbury, twenty-one years of age, was admitted into St. George's Hospital, on the 4th of October, 1820.

He had swelling, and complained of pain and tenderness, of one knee. He was kept in bed; the joint was bathed with a cold lotion. Afterwards blisters were applied. The swelling subsided, but the joint continued weak and painful.

On the 11th of December, for the first time, a tumour was discovered evidently within the cavity of the knee-joint, situated on the edge of the patella, over the external condyle of the femur. The tumour appeared like a loose cartilage, of about the size and form of an almond. When the man attempted to walk, in certain motions of the limb, it slipped into the cavity of the joint, producing considerable distress, and making him lame. An attempt was made to confine it by means of bandages, but without success.

On the 5th of January, 1821, Mr. Ewbank made an incision through the skin, fascia, and synovial membrane, so as to expose the tumour. It was found to be not cartilaginous, but of a gristly structure; of about the length of an almond, but rather broader; and it was attached by one extremity to the synovial membrane, near the edge of the patella. This attachment having been divided the tumour was removed. The edges of the wound were brought into contact, and united by the first intention. Some inflammation of the joint followed, but was subdued without much difficulty. When the patient began to walk, he found himself to have been much relieved by the operation.

Six weeks afterwards, however, a tumour was discovered in the knee of a smaller size than that which had been removed, but occupying precisely the same situation; so that there was sufficient reason to believe that it had grown from the same basis. This tumour could be pressed into the joint by the fingers, but did not slip into it spontaneously in walking; and therefore, at the time when the man left the hospital, he did not suffer any inconvenience from it.

CASE LVI.

Mr. H., a young man, consulted me on the 25th of April, 1822, labouring under the follow-

ing symptoms : — In certain motions of the right knee a tumour presented itself on the inside of the patella, which had been supposed to be, and still had the appearance of being, a loose cartilage of a large size. He said that occasionally, in walking, this substance slipped between the articulating surfaces. The accident always produced considerable pain at the time, and inflammation of the synovial membrane afterwards, which in one instance confined him to his bed for several weeks. He said further, that these symptoms had been gradually coming on for two or three years ; that he had worn bandages, without experiencing any good effect ; and that, as the disease interfered very much with his comfort and occupations, he was desirous of submitting to any operation which afforded him a prospect of relief.

On the 28th of April, after he had remained for one or two days in a state of perfect quietude, I carefully made an incision on the tumour, which had been previously fixed by the finger of an assistant over the inner condyle of the femur. When it was thus exposed, I found it to be, not a loose cartilage, but a tumour of a fleshy structure ; and that it was connected to the synovial membrane, below the patella, by a broad adhesion. Having divided this adhesion, I removed the tumour. The edges of the wound were brought together by means of a suture passed through the integuments, and

stripes of adhesive plaster. The patient was kept in bed, and the limb was supported by a splint, to which it was secured by bandages in such a way as to render the joint quite incapable of motion.

About twenty-two hours after the operation, symptoms of violent inflammation began to show themselves. There was almost insupportable pain; the joint became rapidly swollen; the pulse rose to 90 in a minute, and was hard and strong. By means of very active antiphlogistic treatment, however, the inflammation subsided, without producing any bad consequences. On the 27th of June he was able to undertake a journey a considerable distance from London; at which time the knee was neither swollen nor painful, but it was still incapable of perfect flexion and extension. Since then the patient has recovered the perfect use of the joint.

On examining more accurately the tumour which had been removed in this case, it was found to be about two inches and a half in length, and one inch and a half in breadth, and somewhat less than half an inch in thickness in the thickest part; convex on one surface, and somewhat flattened on the other. It was of a firm, fleshy structure. The general appearance of it a good deal resembled that of the coagulum which is found in the sac of aneurism; but it was not laminated: it had a smooth membranous surface; and it was manifestly organised, as

vessels might be distinctly traced ramifying through its substance.*

In each of these cases the operation was resorted to under the impression that the substance contained in the cavity of the joint was one of the loose cartilages of which I have spoken in the beginning of this chapter. If I had been acquainted with the real nature of the disease in the last case, I should certainly have been less inclined to attempt its extirpation; and the violence of the inflammation which ensued must form an additional reason for hesitation in any future case of the same kind.

But the question will arise, how are such firm fleshy tumours, which are capable of altering their position in the cavity of a joint, and which produce symptoms similar to those which are produced by loose cartilages, to be distinguished

* A remarkable circumstance occurred in the progress of this case. The wound made in the operation united by the first intention; but the joint being much distended with synovia, the adhesion gave way; so that the wound was reopened on the ninth or tenth day, and the synovia escaped in a small but constant stream. The discharge of synovia continued; but the joint being carefully retained in a state of the most perfect quietude, supported on a splint, no additional inflammation was the consequence. At last the flow of synovia ceased; the wound gradually closed, and in the course of three or four weeks was firmly cicatrised. The same thing happened, under my observation, in another case, after the removal of a loose cartilage from the knee.

from the latter? Perhaps, being aware of the possibility of the existence of a tumour of this description, we may, by a very careful examination, be enabled to ascertain, even through the superjacent soft parts, that it has not the same degree of hardness with cartilage itself. I am not at present acquainted with any other circumstances on which our diagnosis can be founded. Fortunately, however, it happens, that, while loose cartilages in joints are not uncommon, such fleshy tumours as I have just described are of very rare occurrence.

Among the valuable essays illustrative of practical surgery, published by the late Mr. Hey of Leeds, there is one in which he gives an account of certain cases in which he supposed the patients to have suffered from what he has termed an internal derangement of the knee-joint. These cases, affecting as they do, not indeed the life, but the comfort of the individual, are well deserving the attention of the surgeon; and for reasons which will presently be apparent, I am led to believe that the consideration of them can nowhere be more properly introduced than in connection with that disease which forms the subject of the present chapter.

The patient, in using the limb, suddenly finds the leg fixed at an angle to the thigh, with more or less pain. By making a more complete flexion, and then a sudden extension of the leg, or by

some other management, the mobility of the joint is restored. The accident however recurs, sometimes at longer, sometimes at shorter intervals, and this state of things may go on for years. In one case the restoration of the joint to its natural condition is accomplished easily; in another with difficulty; and according to circumstances which we cannot explain, the accident is followed by much or little inflammation, or by no inflammation at all.

I am not aware that any examination has been made of a joint liable to these affections, so as to afford us any certain evidence as to the peculiar condition of it on which the symptoms depend. It is difficult to understand how there should be any actual displacement of parts so fixed by their attachments as the crucial ligaments or the semilunar cartilages. The symptoms very much resemble those produced by a loose cartilage within the joint. But in the cases here referred to, no loose cartilage can be detected. However, it may well be that there is a loose cartilage, or some kind of pendulous excrescence, which occasionally slips into the space between the articulating extremities of the bone, though it is never so situated as to be perceptible externally, and this on the whole seems to be the most probable hypothesis. Still it must be owned that the subject is open to further inquiry, and that the facts which I am about to state are not very easily to be reconciled either with this hypothesis, or with that suggested by Mr. Hey. A medical

practitioner, at the western end of London, occasionally found his leg fixed at an angle to the thigh in the manner which has been described. By experience he had learned the management of his own case, and by certain motions of the limb contrived to relieve himself whenever the accident occurred. One day, however, he failed in doing so. He was in consequence seen by the late Mr. Vance, afterwards by myself, and then by Sir Astley Cooper; but we were all equally unsuccessful with himself; and after having made various attempts to extricate the leg from the position in which it had become fixed, and caused the patient to suffer much pain to no purpose, we were compelled to leave him in the situation in which we found him. Much inflammation of the joint followed, which was relieved by the usual remedies. After some weeks (having no written notes of the case, I do not know the exact period) the patient found that the joint had acquired a small degree of mobility. This gradually increased, and at last he regained the perfect use of the limb; could bend and extend the leg, and walk as well as ever. For a considerable time afterwards, during which I occasionally saw him, he had no recurrence of the accident. In the meanwhile he became affected with some organic visceral disease, which compelled him to leave London. Ultimately he died, and I have not heard that the condition of the joint was made the subject of examination after death.

CHAP. IX.

MALIGNANT DISEASES, AND OTHER MORBID GROWTHS
CONNECTED WITH THE JOINTS.

It is well known that the bones are liable to be affected with carcinoma. To that cause are to be attributed the pains in the limbs which sometimes occur in patients who suffer from carcinoma of the breast, and which are often so intense as not to admit of being relieved even by the most powerful opiates. In such cases the bones become so brittle, that they may be fractured by the slightest force, even by the patient accidentally turning himself in bed.

If the articulating extremity of a bone be thus affected, the symptoms which arise will more or less resemble those produced by other diseases of the joint.

CASE LVII.

A lady between sixty and seventy years of age, in the year 1817, underwent the operation for the removal of a scirrhus breast. Some time afterwards a hard tumour showed itself in the cicatrix; and, about the same period, she began

to complain of pain in the left hip and thigh. On the 7th of November, 1820, I saw her in consultation with Mr. Smith, surgeon, of Richmond, by whom she was attended. At this time a large scirrhus tumour occupied the situation of the breast which had been amputated. She complained of pain in the hip, thigh, and knee, which was aggravated by pressure. The pain was very severe, keeping her awake at night, except when she was under the influence of a very large dose of opium. There was a cluster of enlarged glands in the groin, making a hard, and somewhat movable tumour. On the 18th of December following the patient died; and the body was examined by Mr. Smith and myself on the following day.

We found that the thigh-bone had been broken transversely about two inches below the neck; and it was evident, from the appearance of the fracture, that it had taken place either immediately before or after death. In either case, it must have been the result of some very trifling accident. The whole of the superior extremity of the thigh-bone was softer and more brittle than natural: but this morbid change was less distinct below than above the fracture, and it was most distinct in that part of the head of the bone which was contiguous to the cartilage. On making a section of the head and neck of the femur, the earthy matter was found to be very deficient, and a cartilaginous or gristly substance was seen blended with the bony structure. In

several places there were spots of increased vascularity, with a deposition of some cheesy matter in the centre. The cartilages were not ulcerated, and there was no effusion of pus, lymph, or serum into the cavity of the joint. The enlarged inguinal glands had the structure of scirrhus; and there was a similar mass of scirrhus lymphatic glands in the pelvis immediately above the crural arch.

The bones are much more liable to be affected by fungus hæmatodes than they are by carcinoma; and the former frequently occurs in them as a primary disease; that is, not having previously shown itself in any other part of the body. Several cases have fallen under my observation, in which a tumour of this description has had its origin in one of the bones of a joint: and it is evident that such a tumour, affecting in its progress the contiguous parts, must, by degrees, completely destroy the structure of the joint.

According to my experience, it is very difficult in these cases to recognise the exact nature of the disease until it has made considerable progress. Very frequently, while in its early stage, it causes the patient so little inconvenience, that he scarcely thinks it worth while to seek surgical advice. After some time a dull pain is experienced in the joint, which is somewhat aggravated by exercise, and the increase of size is too palpable to be overlooked. As the tumour in-

creases, it is found to be elastic in some parts, and probably hard in others. For a considerable time it does not interfere with the functions of the joint, which, however, afterwards becomes limited in its motion, and ultimately completely fixed in one position. I have known only a single case in which the patient did not submit to amputation before the disease had reached its most advanced stage; and here the skin became ulcerated, and a large ill-conditioned ulcer was the consequence.

The two following cases will sufficiently illustrate the foregoing observations.

CASE LVIII.

William Williamson, fourteen years of age, was admitted into St. George's Hospital on the 21st of September, 1831, on account of a tumour on the inside of the right knee, extending from about two inches below the tubercle of the tibia upward, over the inner condyle of the femur, as high as one fourth of that bone, and backward so as to occupy the ham. The boundaries of the tumour were distinctly defined. It seemed to have had its origin in the head of the tibia, and the tendons of the inner ham-string were seen stretched over its surface at the upper part, and apparently terminating in it below. The circumference of the knee-joint, in the situation of the tumour, was eighteen inches. The skin covering

the tumour was tense and shining, with large tortuous veins ramifying in it.

On examining it with the hand, some parts of the tumour were found to be hard, while others were soft and elastic.

The joint admitted of some degree of motion, but was kept in the half-bent position. The tibia appeared to be the only bone implicated in the disease.

The patient had, generally, had good health; and seemed to be free from all other disease at the time of his being admitted into the hospital.

He stated that in April, 1831, he first experienced a slight degree of pain in the head of the tibia, especially in walking. About six weeks afterwards he observed a slight enlargement of the bone, which from that time gradually increased.

September 29. The limb was amputated.

On examining the knee-joint, the tumour was found to be wholly formed by an expansion of the head of the tibia. The upper and inner part of the tumour was composed, partly of cysts containing a bloody fluid, and partly of organised medullary substance. In other parts there was a mass of bony and cartilaginous substance, disposed in fibres, which seemed to proceed from what had been the surface of the original bone, and presented a somewhat radiated appearance. The other bones, the cartilages, and the soft parts composing the joint, were in a natural state.

CASE LIX.

Louisa Burton, a girl of a delicate habit, was admitted into St. George's Hospital, on the 2nd of March, 1836. She stated that she had been out of health for some time, and, for the last fifteen months, had experienced shooting pains in the right shoulder, gradually increasing in severity.

At the time of her admission there appeared to be some enlargement in the situation of the upper extremity of the humerus. She complained of pain when the head of the humerus was pressed against the surface of the glenoid cavity of the scapula, but not when, by placing the hand on the elbow, pressure was made in the direction upwards. Pain was also occasioned by raising the elbow, so that the limb should form a right angle with the body.

An issue was made with caustic behind the shoulder, and a mercurial treatment was employed. It was supposed at the time that some improvement had taken place; but the patient left the hospital on the 30th of May, as the air of it did not agree with her general health.

On the 18th of January, 1837, she was readmitted into the hospital. She was now in a better state as to her general health, but there was a visible increase in the size of the head of the humerus. She complained of severe pain

when pressure was made on this part, but she had little pain otherwise.

Soon after her admission she had a severe attack of erysipelas, under which she sunk and died.

On examining the body, the synovial membrane and capsular ligament of the shoulder-joint were found to be free from disease. The cartilage lining the glenoid cavity of the scapula was in a natural state. The cartilage covering the head of the humerus was much attenuated, and was easily separated from the bone. In some parts it was nearly transparent, and had the appearance of membrane, rather than of cartilage.

Immediately underneath the cartilage the bone had disappeared, and in its place there was a soft organized mass, of a reddish colour, elastic to the touch, resembling a medullary tumour, but of a firmer consistence than is usual. At the posterior part of the humerus, below the greater tuberosity, there was a protrusion of the same morbid growth of the size of a small chesnut. On the inside of the neck of the humerus, and in the upper part of the shaft of the bone, the vascular substance already mentioned was continued into a more dense structure, approaching to the consistence of cartilage, and very similar to scirrhus in appearance.

I have no reason to believe that any truly malignant disease ever has its origin in the synovial membrane. At any rate such an occurrence must be rare, as no example of it has fallen under my own observation. It appears, however, that the same exemption does not extend to the fibrous structures ; as in the pathological museum of St. George's hospital there is a preparation taken from a patient under the care of Mr. Cæsar Hawkins, in which a large fungous tumour, connected with the knee-joint, seems to have had its origin from the loose edge of the patella and the ligament of the patella. In this case, notwithstanding the existence of some enlarged glands in the groin, the limb was amputated. The patient died very soon afterwards, labouring under visceral disease.

It is plain that whether the malignant disease affecting a joint be scirrhus or fungus hæmatodes, or partaking of the nature of both the one and the other, the surgeon has nothing to offer in the way of remedy but amputation ; and the only question is, how far is it probable that even this will lead to the patient's cure ? I am afraid that there is no one who has had much experience in these matters who can feel himself justified in entertaining any sanguine hopes of the ultimate success of an operation performed under these circumstances. There is no doubt that, in the great majority of instances where we have the opportunity of tracing the patient's history afterwards, we find that the disease has returned

either in the limb itself, or in some of the viscera. In a very few cases, however, it is otherwise.

CASE LX.

In June, 1836, I was consulted respecting a young lady, about eighteen years of age, who laboured under a considerable enlargement of one shoulder. The head of the humerus was expanded into a broad and somewhat elastic tumour. There was some but not considerable pain in the joint. The mobility of spine was necessarily impaired by the increased size of the humerus, but did not seem to be affected otherwise.

In a consultation between Sir Astley Cooper and myself, it was agreed that the limb should be removed at the shoulder-joint, which operation I afterwards performed in the presence of Sir Astley Cooper and Mr. Aston Key.

The scapula, the cartilage lining the glenoid cavity, the capsular ligament, and synovial membrane of the joint, were in a healthy state. The disease was wholly confined to the head of the humerus, which was converted into a medullary or fungous tumour of considerable size, with very little remains of earthy material in it. The cartilage remained entire, adhering to the surface of the morbid growth.

The wound healed readily, and I know that there had been no return of the disease two

years afterwards. I have heard nothing of the patient since that period.

It is to be observed that in this instance the whole of the humerus, that is, the whole of the organ in which the disease was situated, was removed. It is probable that the success of the operation in such cases depends mainly on that circumstance. When a scirrhus tumour is imbedded in the gland of the breast, no experienced surgeon would be satisfied with any operation short of that of removing the entire breast, and the impossibility of doing more than to remove a portion of the tongue, affords a reasonable explanation of the almost universal failure of an operation when that organ is the seat of malignant disease.

Are we, then, to conclude that, when a joint is affected by malignant disease, it is never advisable to amputate the limb, unless the whole of the bone in which the disease exists can be taken away? For example, that we are justified in recommending the amputation of the thigh, if the disease be limited to the head of the tibia, but not if it be in the condyles of the femur? The question is of great practical importance, and deserves further consideration.

CASE LXI.

Mr. O., twenty-five years of age, in January 1828, first experienced a sensation of weakness in the right knee, with a slight pain, after walking even a short distance. These symptoms continued; and, in the course of two or three months, he observed a small tumour over the external condyle. He remained in this state, the tumour not increasing in size through the spring, and the greater part of the summer.

In the middle of the following August he one day went through a great deal of fatigue in grouse-shooting; after which the tumour began to increase in size.

On the 1st of September, in walking over a field, his foot slipped into a hollow in the ground. This caused great pain in the knee, and he was under the necessity of riding home. After this accident the tumour progressively increased. On the 25th January, 1829, he came to London, and placed himself under the care of Mr. Griffiths, of Pimlico, and myself. At this time there was a very considerable enlargement of the whole of the upper part of the knee-joint, so that it was four inches more in circumference than the corresponding part of the opposite limb. The tumour was soft and elastic, occupying the situation of both condyles of the femur, but being more especially prominent in that of the outer condyle. The head of the tibia and the

patella did not seem to be implicated in the disease, and the joint retained nearly its natural degree of mobility.

For some time after I was consulted, the tumour remained nearly stationary: then it began to increase; and, as no remedy seemed to have any dominion over the disease, a consultation was held with Sir Astley Cooper, in which it was determined that the limb should be amputated. The operation was accordingly performed on the 6th of July, 1829.

On examining the limb afterwards, the femur was found to terminate abruptly about five inches above the knee-joint. In place of the condyles and lower part of the shaft of that bone, there was a large tumour, of an irregular form, the structure of which *bore a nearer resemblance to that of fungus hæmatodes than of any other morbid growth*. The cartilage which had covered the surface of the condyles of the femur was seen expanded over the lower part of the tumour; being everywhere thinner than natural, but nowhere in a state of ulceration. In some parts it had contracted adhesions to the cartilage covering the head of the tibia.

In other parts the tumour was covered by some thin remains of the periosteum, and a layer of thickened cellular membrane.

I heard of this patient being alive and well, having had no occurrence of the disease some years after the operation.

I have transcribed the above history from the

notes of the case which were taken at the time, and which were afterwards published in the third and fourth editions of the present work. It may be observed that the structure of the tumour is described *not as being that of fungus hæmatodes, but as bearing a nearer resemblance to it than to that of any other morbid growth*. It would appear, therefore, that I must, in the first instance have entertained some doubts as to the exact nature of the disease. To whatever extent these doubts existed, subsequent observations have satisfied me that they were not without foundation, and have, indeed, led me to the conclusion that the disease was not *fungus hæmatodes*, but a peculiar change in the structure of the femur, of local origin, and not, in the proper acceptation of the term, of a malignant nature.

1. In the preparation taken from this case, which is preserved in the Museum of St. George's Hospital, the effect produced by the spirit is such that it is impossible to form an opinion as to the exact character which the disease presented in its recent state. A drawing made by Mr. Perry, whose accuracy as an anatomical draughtsman is well known to the anatomists of this metropolis, supplied this deficiency. It is there seen that the tumour consisted of a congeries of thin membranous cells, in which a solid matter, of no very distinct organisation, was contained.

2. Another preparation, also in the Museum of St. George's Hospital, exhibits a disease, which is evidently of the same nature with that in

the case which has been just described. The membranous cells are here seen in the preparation itself; but they are still more distinct in the drawing of the recent parts made by the same artist. The patient who was the subject of this disease was carrying a heavy burden, when his right foot became entangled in a hole in the ground, and he fell. He immediately experienced a severe pain in the knee, and it was after this accident that the enlargement of the joint was first observed. The tumour continued to increase, with a severe shooting pain, until it was twenty-six inches in circumference. Six years from the time of the first appearance of the disease I amputated the thigh in St. George's Hospital. I have since heard of the patient, who was alive and well, having had no recurrence of the disease several years afterwards.

3. Many years ago Sir Astley Cooper and myself were consulted respecting a lady having a tumour of the knee, the external character of which bore a very close resemblance to what was observed in the two preceding cases. In this instance, also, the patient's attention was first called to the disease after an accident in walking. Besides the large tumour in the situation of the condyles of the femur, there was a manifest enlargement of the whole shaft of that bone, which led Sir Astley Cooper and myself to believe that it partook of the disease of the epiphysis, and that we were therefore not justified in recommending amputation. I have lately had the opportunity

of seeing the patient. The tumour of the knee is larger than when I was formerly consulted; but no ulceration of the skin has taken place. There is no enlargement of the inguinal glands; nor are there any other circumstances which justify the conclusion that the disease is of a malignant nature.

If the conclusion at which I have now arrived, as to the nature of the three last-mentioned cases, be correct, I have no sufficient evidence to offer in favour of an operation performed for the removal of a joint affected with malignant disease, in which a portion of the bone, in which the disease has originated, is allowed to remain. Cases may have occurred in which there was no recurrence of the disease under these circumstances; but there has been no such favourable result in any of those in which I have had the opportunity of learning the patient's history afterwards; and, as I have already observed, it is not what our experience of the effects of operations performed for malignant diseases in other organs would lead us to expect. I confess that it seems to me that the rule of practice is sufficiently obvious, though there may be some difficulty in the application of it to individual cases, on account of our having no certain marks by which we may, at all times, and in every instance, distinguish diseases which are malignant, and diseases which are not malignant, from each other.

Morbid growths, having their origin in the bone or periosteum in the immediate vicinity of a joint, are more or less liable to be confounded with disease beginning in the joint itself; and at all events as they increase in size, they cannot fail to produce the effect of limiting the motions of the joint, and ultimately destroying its organisation. The following case will serve to illustrate the foregoing observations.

CASE LXII.

A lady, in the year 1808, first observed a swelling in the upper part of one knee, which was unattended by pain, and which increased slowly, but uniformly. In the course of three years it had attained so inconvenient a magnitude, that she was induced to consent to the loss of the limb. Mr. Thomas, under whose care the patient was, amputated the joint, and allowed me to examine it afterwards.

The tumour occupied the upper part of the knee, beginning at the edge of the cartilaginous surface, and extending about three or four inches up the lower part of the thigh. It was interposed between the muscles and the bone of the thigh, so that the former were seen expanded over it. It was of a greyish-white colour; composed of fibres of a gristly semi-transparent substance, with osseous matter intermixed with it, and about two inches in thickness on each side

of the femur. At the upper part it was seen distinctly originating in the periosteum ; at the lower part, the periosteum could not be traced, and the structure of the bone was continuous with that of the tumour. The cartilages and ligaments of the joint were free from disease. On the external surface of the synovial membrane, unconnected with the diseased structure above, there were three or four flattened bodies ; each of about the size of a kidney bean, of a white colour, and of a texture somewhat softer than that of cartilage. The synovial membrane itself was free from disease.

I met with another case in which the patient appeared to labour under an enormous tumour of the hip. It was ascertained, by dissection, that the hip itself was free from disease, and that the enlargement was formed by an osteo-sarcomatous growth from the periosteum of the upper extremity of the femur. Two other cases have come under my observation, apparently similar to that just mentioned, but in which I had not the opportunity of examining the parts by dissection.

CHAP. X.

NEURALGIA OF THE JOINTS.

THE term Neuralgia merely expresses the fact that pain is referred to a part which is not the actual seat of the disease. Neuralgia of the joints, therefore, like neuralgia of other organs, may arise under very different circumstances. The cause may be purely local. For example : — A man was admitted into St. George's Hospital under the care of Sir Everard Home, complaining of pain in the knee, and of nothing else. On inquiring into his case, however, it was found that he also laboured under a femoral aneurism. Sir Everard Home applied a ligature round the artery above the tumour, which immediately became diminished in size, the pain in the knee subsiding at the same time. The patient died afterwards of venous inflammation consequent on the operation; and on examining the limb I found that some branches of the anterior crural nerve lay on the surface of the tumour, which terminated in the exact spot to which the pain had been referred, and thus at once explained the origin of the pain, and the subsiding of it on the tumour becoming reduced in size after the ligature of the artery.

But by far the most frequent cause of neuralgia of the joints is an hysterical state of constitution. It may therefore well be supposed that the disease is more common in the female than in the male sex. The latter, however, is not altogether exempt from it. Some years ago a large proportion of the cases which were treated as those of diseased joints were of this description; and, looking back at the early part of my own practice, I am sensible that the mistake is one which I have often made myself. The subject is now better understood by surgeons: nevertheless the same mistake is occasionally made even at the present time.

Having elsewhere given a detailed account of this order of cases*, it will be sufficient for me in this place to give a general description of them without entering into the history of the individual cases on which my observations have been founded.

The persons most liable to be thus affected are young women of a hysterical constitution, especially those belonging to the more affluent classes of society, living in hot rooms, taking little exercise in the open air, and of self-indulgent habits. Others, however, are not altogether exempt from the disease, and we meet with it occasionally in those who have been brought up in the most prudent manner, in female servants, and even among the peasantry.

* Lectures Illustrative of certain Local Nervous Affections, page 34. et seq.

The symptoms may frequently be traced to the circumstance of the patient's attention having been anxiously directed to a particular joint. Sometimes they have followed a blow or wrench, or some very trifling injury. At other times, when one sister has laboured under an actual disease of the spine or hip, in another the same parts have become the seat of hysterical neuralgia. At first there is pain referred to the affected joint, of which the patient complains in different degrees, not only in different cases, but even in the same case, at different periods. Often, if her thoughts are occupied by some other object of interest, she seems to forget the pain altogether, although there is no doubt that at another time she suffers severely. The pain is variously described, but it has an anomalous character, and the description of it rarely corresponds to that of pain arising from inflammation. The joint is tender, but the tenderness is peculiar also. A light touch, or even pinching the skin, will often cause more pain than a firm and steady pressure, causing the patient to wince, and even exciting motions very similar to those of chorea. The same handling of the joint, which seems to cause great distress when the patient is questioned on the subject, if her attention can be directed to other matters, will be altogether unnoticed. Another very characteristic circumstance is, that whatever the pain may be during the day it does not awaken her from her sleep at night. When the spine is affected the pain is referred

not to any one spot, but to various parts — from the lower part of the loins to the upper part of the back. Many cases, to which the undefined appellation of spinal irritation has been of late years applied, are examples of this constitutional affection, and not of any local disease.

Occasionally, when a joint has been for a considerable time the seat of hysterical pain, a slight degree of diffused swelling is perceptible in it, apparently the consequence of some effusion into the cells of the cellular texture external to it. This corresponds to what may be observed in some other cases of neuralgia. In a gentleman who was the subject of facial neuralgia (*tic douloureux*) attended with an unusual degree of suffering, there was the same kind of swelling of the face, although there could be no doubt that the real seat of the disease was not in the nerves, but in the brain itself.

At other times there is a periodical change of temperature, not only of the affected joint, but even of the whole limb. In the morning it is cold and pale, and shrunk. Towards evening there is evidence of a more active circulation. The surface of the skin is sensibly hot, red, and shining. During the night the heat and redness subside, and these alternations are as regular as the paroxysms of an ague. Such cases are not very uncommon, and they are always very perplexing to the practitioner who, for the first time, is consulted about them.

The recovery of patients labouring under these

hysterical afflictions is often very tedious. But much depends on the treatment, moral as well as physical.

The sulphate of quinine, preparations of iron, the citrate of quinine and iron, may generally be exhibited with advantage; and these may, according to circumstances, be combined with ammonia or the ammoniated tincture of valerian. In most instances the bowels are in a very torpid state, and active purgatives are from time to time required. The air of the country, and especially that of the sea-coast, is more favourable to the patient than that of a large town; and while at the sea-side she may use cold sea-bathing with advantage during the summer and early part of the autumn. However, as to constitutional treatment, the best rule that can be laid down is, that the medical attendant should inquire into the state of the general health, and prescribe for the patient according to the circumstances of each individual case. If the menstruation be irregular, deficient, or excessive, he should make it an especial object to restore this function to a healthy condition.

In those cases in which the limb is alternately cold in the morning, and hot, red, and shining in the evening, quinine may be exhibited, as in other intermitting diseases, with the greatest advantage. In proportion as the circulation is deficient and the limb cold at one period of the day, so is the reaction greater at another. The observation of this circumstance has led me to

direct that the limb should be covered by a thick stocking of what is called *fleecy* hosiery in the morning, with a large loose case or boot of oiled silk drawn over it; and that in the evening, when the skin begins to be red and hot, this covering should be removed, and compresess, wet with a spirituous lotion, substituted for it. I have found this treatment to produce a marked mitigation of the symptoms.

To a considerable extent these cases admit of being benefited by medical and surgical treatment; but what I have termed the moral treatment of them is of still greater importance. If a young lady who is thus afflicted be confined to her sofa, her attention being constantly directed to her complaint by the anxious inquiries of her friends, the daily visits of her medical attendant, and the exhibition of a variety of drugs, the symptoms may continue unaltered for many months, and even (and that is by no means an unusual occurrence) for several years. The very opposite course to this should be pursued. Her attention should be as much as possible directed to other objects. She should enter into the society, and join in the pursuits, of persons of her own age. She should be encouraged to use the limb, even though the attempt to do so gives her pain in the first instance; and she should pass a portion of each day in the open air. Under this mode of treatment I have known many cures to be obtained without any medical or surgical treatment whatever.

The time which elapses before the cure is complete differs in different cases, and according to a variety of circumstances. In some instances the cure is, or seems to be, instantaneous. A young lady who laboured under an hysterical affection, simulating disease of the hip joint, recovered suddenly one night while in the act of turning in bed. In other instances the symptoms have been relieved on the exhibition of some new medicine, or the application of some new plaster or liniment, which therefore has obtained, though it has not deserved, the credit of the cure. Any considerable impression suddenly made on the nervous system may produce the same result. A young lady, who had long laboured under hysterical neuralgia of the hip and thigh, immediately lost all her symptoms on being thrown from a donkey which she was riding. Another case has been published as an example of a cure by divine interposition, — the immediate cause of it being the prayers of the patient's spiritual instructor, and his command "in the name of the Saviour that she should get up and walk." As might be expected, examples of similar cures have been furnished by mesmerism and homœopathy.

CHAP. XI.

CHRONIC ABSCESS IN THE ARTICULAR EXTREMITY OF
THE TIBIA.

CHRONIC inflammation, producing a chronic enlargement of the epiphysis, is a not unfrequent occurrence, and is liable to be mistaken for disease in the joint itself; the more so, as inflammation of the synovial membrane sometimes occurs as a secondary disease. The patient, under these circumstances, may derive benefit from the use of sarsaparilla, mercury, hydriodate of potash, or mezereon; from the application of blisters, and in some instances from the division of the inflamed and thickened periosteum; in short, from any of those remedies which are found to be useful where nodes are formed in other parts of the bones.

Occasionally chronic inflammation of the articular extremity of the tibia terminates in the formation of an abscess in the centre of the bone, but contiguous to the joint. An abscess of this kind is attended with an extraordinary degree of suffering, such as not only would justify amputation, if there were no other means of obtaining relief, but would induce the patient cheerfully to submit to the operation. Fortunately a less formidable mode of cure is within our reach. My

first knowledge of this disease was derived from the following case.

CASE LXIII.

Mr. P., about twenty-four years of age, consulted me in October, 1824, under the following circumstances:—

There was a considerable enlargement of the lower extremity of the right tibia, extending to the distance of two or three inches from the ankle-joint. The integuments at this part were tense, and they adhered closely to the surface of the bone.

The patient complained of a constant pain, referred to the enlarged bone and neighbouring parts. The pain was always sufficiently distressing; but he was also liable to more severe paroxysms, in which his sufferings were described as most excruciating. These paroxysms recurred at irregular intervals, confining him to his room for many successive days, and being attended with a considerable degree of constitutional disturbance. Mr. P. described the disease as having existed more than twelve years, and as having rendered his life miserable during the whole of that period. In the course of this time he had been under the care of different surgeons, and various modes of treatment had been resorted to without any permanent advantage. The remedies which I prescribed for him were equally

inefficacious. Finding himself without any prospect of being relieved by other means, he made up his mind to lose the limb by amputation; and Mr. Travers having seen him with me in consultation, and having concurred in the opinion that this was the best course which could be pursued, the operation was performed accordingly.*

On examining the amputated limb, it was found that a quantity of new bone had been deposited on the surface of the lower extremity

* It is right that I should state briefly the termination of the case; especially as the circumstances attending it were probably connected with a peculiar condition of the nervous system, occasioned by the long continuance of the local disease. Unfortunately I preserved no notes of this part of the case at the time; but I have no doubt that my recollection is accurate as to the following particulars. The patient bore the operation with the utmost fortitude, but immediately afterwards he was observed to become exceedingly irritable, restless, and too much disposed to talk. Unfortunately, in the evening, there was hæmorrhage from the stump, which ceased, however, on the removal of the dressings and coagulum. During the night he had no sleep; and on the following day he was restless and incessantly talking, with a rapid pulse. These symptoms became aggravated. There was no disposition to sleep, and the pulse became so rapid that it could be scarcely counted. Until the third or fourth day the tongue remained clean and moist. After this period it became dry, and somewhat brown, and there was constant delirium. The pupils were widely dilated, and the sensibility of the retina was totally destroyed; the glare of a candle not being perceptible even when held close to the eye. Death took place on the fifth day after the operation. No morbid appearances were observed in the post-mortem examination.

of the tibia. This deposition of new bone was manifestly the result of inflammation of the periosteum at some former period. It was not less than one third of an inch in thickness ; and, when the tibia was divided longitudinally with a saw, the line at which the new and old bone were united with each other was distinctly to be seen.

The whole of the lower extremity of the tibia was harder and more compact than under ordinary circumstances, in consequence, as it appeared, of some deposit of bone in the cancellous structure ; and in its centre, about one third of an inch above the ankle, there was a cavity of the size of an ordinary walnut, filled with a dark-coloured pus. The bone immediately surrounding this cavity was distinguished from that in the neighbourhood by being of a whiter colour, and of a still harder texture, and the inner surface of the cavity presented an appearance of great vascularity. The ankle-joint was free from disease.

It seems highly probable that, if the exact nature of the disease had been understood, and the bone had been perforated with a trephine, so as to allow the pus collected in its interior to escape, a cure would have been effected without the loss of the limb, and with little or no danger to the patient's life. Such, at least, was the opinion which the circumstances of the case led me to form at the time ; and I bore them in my mind, in the expectation that, at some future period, I might have the opportunity of acting

on the knowledge which they afforded me, for the benefit of another patient.

CASE LXIV.

Mr. B., at that time twenty-three years of age, consulted me in the beginning of February, 1826. There was considerable enlargement of the right tibia, beginning immediately below the knee, and extending downwards, so as to occupy about one third of the length of the bone.

Mr. B. complained of excessive pain, which disturbed his rest at night, and some parts of the enlarged bone were tender to the touch. The knee itself was not swollen, and its motions were perfect.

He said that the disease had begun more than ten years ago, with a slight enlargement and pain in the upper extremity of the tibia; and that these symptoms had gradually increased up to the time of my being consulted. Various remedies had been employed, from which, however, he had derived little or no advantage.

Having inquired into the circumstances of the case, I was led to regard it as one of chronic periostitis; and I adopted the following method of treatment.—An incision was made longitudinally on the anterior and inner part of the tibia, extending from the knee four inches downwards, and penetrating through the periosteum into the substance of the bone. The periosteum was

found considerably thickened, and the new bone, which had been deposited beneath, was soft and vascular. The immediate effect of the operation was to relieve the pain which the patient suffered, so that he slept well on the next and every succeeding night. After this I prescribed for him a strong decoction of sarsaparilla. The wound gradually healed; and it was for some time supposed that a perfect cure had been accomplished. The enlargement of the upper extremity of the tibia, however, never entirely subsided; and in August, 1827, pain was once more experienced in it. At first the pain was trifling, but it gradually increased; and when I was again consulted, in January, 1828, Mr. B. was unable to walk about, and quite unfit for his usual occupations. At this period the pain was constant, but more severe at one time than at another, often preventing sleep during several successive nights. The enlargement of the tibia was as great as when I was first consulted; and the skin covering it was tense, and adhering more closely than is natural to the surface of the bone. Some remedies which I prescribed were productive of no benefit. The patient's sufferings were excruciating, and it was necessary that he should, if possible, obtain immediate relief. The resemblance between the symptoms of this case and those of the case last described was too obvious to be overlooked. It appeared highly probable that they depended on the same cause; and I therefore proposed that the bone should

be perforated with a trephine, in the expectation that an abscess would be discovered in its interior. To this the patient readily assented; and, accordingly, the operation was performed in the beginning of March 1828.

My attention was directed to a spot about two inches below the knee, to which the pain was especially referred. This part of the tibia was exposed by a crucial incision of the integuments. The periosteum now was not in the same state as at the time of the former operation: it was scarcely thicker than natural, and the bone beneath was hard and compact. A trephine of a middle size was applied, and a circle of bone was removed, extending into the cancellous structure, but no abscess was discovered. I then, by means of a chisel, removed several other small portions of bone at the bottom of the cavity made by the trephine. As I was proceeding in this part of the operation, the patient suddenly experienced a sensation, which he afterwards described as being similar to that which is produced by touching the cavity of a carious tooth, but much more severe; and immediately some dark-coloured pus was seen to issue slowly from the part to which the chisel had been last applied. This was absorbed by a sponge, so that the quantity of pus which escaped was not accurately measured; but it appeared to amount in all to about two drachms. From this instant the peculiar pain belonging to the disease entirely ceased, and it has never returned. The

patient experienced a good deal of pain—the consequence of the operation—for the first twenty-four hours; after which there was little or no suffering. The wound was dressed lightly to the bottom with lint. Nearly six months elapsed before it was completely cicatrised; but, in about three months from the day of the operation, Mr. B. was enabled to walk about and attend to his usual occupations. He continued well when I last saw him on the 7th of January 1832; and the tibia was then reduced in size, so as to be scarcely larger than that of the other leg. No exfoliation of bone had ever taken place.

Since the occurrence of this case, five similar cases have come under my care, in every one of which a complete cure was at once obtained by the same operation: so that I have the satisfaction of knowing that in my own practice as many as six individuals have been enabled to preserve limbs which must inevitably have been amputated if the dissection of the limb in one other case had not made me acquainted with the real nature of the disease under which they laboured. In confirmation of this last observation, I need only refer to an interesting statement, published by Mr. Kirby, in the “Dublin Medical Press,” for December 3. 1845, which will explain the ravages ultimately produced by this disease, if it be not relieved by art.

Having in another publication given the details of all the cases to which I have just referred*, it seems unnecessary for me to do more at present than to offer a few general observations on the subject.

Chronic abscess of the extremity of the tibia may exist during a very long period before it interferes with the neighbouring joint. In one case the patient had laboured under the symptoms of the disease for as many as eighteen years before I was consulted. The symptom by which the disease is indicated in the first instance is pain in the affected part, which is more or less of an intermitting character. The pain gradually becomes more severe, but still it is intermitting. For some time the patient may suffer so little from it, that he is not prevented from attending to his usual occupations; then, without any manifest reason, a paroxysm occurs, in which the pain is intense, he is utterly disabled, and even unable to quit his bed. This gradually subsides and he has another interval of ease. As the disease goes on, the bone becomes increased in size, the general health becomes affected, and the mind probably is rendered miserable and irritable by long-continued suffering. In one case, whenever the patient began to use the limb the knee itself became inflamed, and there was an effusion of fluid into the cavity of

* Lectures illustrative of various subjects in Pathology and Surgery, lecture 21.

the synovial membrane. The case of Hendrow, already recorded in the sixth chapter of the present volume, explains the probable cause of this complication to have been the attempt of the abscess to make its way into the knee-joint, through the cartilage of the tibia. If, in this case, the application of the trephine had been much longer delayed, we cannot doubt that the joint would have been destroyed, and that there would have been no means of relieving the patient except by amputation.

Now, I do not say that in all cases in which the combination of symptoms exists which I have just described, the surgeon should at once conclude that there is an abscess in the interior of the bone, and that the trephine should be applied for the purpose of making an opening into it. For the most part there can be no danger in deferring the operation until it has been ascertained whether such remedies as mercury, sarsaparilla, or iodide of potassium (which are known to have the power of subduing chronic inflammation of bone), will afford the desired relief. But if these methods fail, I cannot doubt that it is the duty of the surgeon to perforate the bone with the trephine. Hitherto, in no instance in which I have performed the operation, have I failed in discovering the abscess. But, even if abscess should not exist, I can conceive that the perforation of the bone, by relieving tension, and giving exit to serum collected in the cancellous

structure, might be productive of benefit ; and at all events the operation is simple, easily performed, and cannot itself be regarded as in any degree dangerous.

The most important point in the operation is that of ascertaining the exact part at which the trephine should be applied. I have always found that there was one spot to which the pain was more especially referred, and which was more especially sensible to pressure ; and when this has been satisfactorily determined, I have concluded that this was the part at which the perforation should be made. The trephine, which I have generally used, is a little more than half an inch in diameter, and is made without any projecting rim, so that there is nothing to prevent it penetrating to any depth that may be required. Sometimes when I have taken out a portion of the bone by means of the trephine, I have found it expedient to make use of a common elevator to complete the operation, by breaking down the immediate boundary of the abscess, but I have never yet had occasion to make a second application of the trephine. However, such an occasion may occur. A very experienced hospital surgeon applied the trephine for a supposed abscess in the head of the tibia. No abscess however was discovered, and in consequence the limb was amputated. On the parts being examined afterwards, the abscess was discovered, at a small distance from the perforation made in

the operation : and it was plain that the removal of a small portion more of the bone would have preserved the patient's limb.*

* The late Mr. Hey, in his *Practical Observations on Surgery*, has given the history of several cases, in which he applied the trephine to the tibia affected with caries. But these cases were very different from those which form the subject of the present chapter ; there having been, not a defined abscess in the centre of the bone, but an external sore, with thickened periosteum, and an aperture in the bone, through which a probe could be passed into the internal cavity.

CHAP. XII.

ON CARIES OF THE SPINE.

SECT. I.

Pathological Observations.

ALTHOUGH it is not to be supposed that the synovial membranes belonging to the joints between the articulating processes of the vertebræ are altogether exempt from the liability to inflammation, there is no doubt that inflammation is, in them, a rare occurrence, and no case has fallen under my own observation in which the existence of such disease was proved by the examination of the dead body.

It is obvious that no diseases corresponding to those of the synovial membrane can occur in the joints between the bodies of the vertebræ. But analogy would lead us to expect, and experience demonstrates, that those diseases which occur in the harder textures may occur here as elsewhere, and that an extensive caries of the spine may have its origin, sometimes in ulceration of the intervertebral cartilages, and at other times in a morbid condition of the cancellous structure of the bones.

In one of the cases which have been related in

a former chapter, where ulceration of the articular cartilages had begun in several other joints, those between the bodies of some of the dorsal vertebræ were found to have been very much altered from their natural structure. I had an opportunity of noticing a similar morbid condition of two of the intervertebral cartilages in a patient who, some time after having received a blow on the loins, was affected with such symptoms as induced Mr. Keate to consider his case as one of incipient caries of the spine, and to treat it accordingly, with caustic issues; and who, under these circumstances, died of another complaint.

Opportunities of examining the morbid appearances in this very early stage of disease in the spine are of very rare occurrence, but they are sufficiently frequent where the disease has made greater progress; and in such cases I have, in some instances, found the intervertebral cartilages in a state of ulceration, while the bones were either in a perfectly healthy state, or merely affected with chronic inflammation, without having lost their natural texture and hardness; while in others it has been manifest that the original disease has been that peculiar scrofulous condition of the bones, the effects of which in the bones and joints of the extremities have been described at length in a former chapter.

The following cases illustrate the foregoing observations, and (if I am not mistaken) will be found to exhibit the more important changes

connected with caries of the spine as far as this can be ascertained by dissection.

CASE LXV.

Christiana Clear, a girl eight years of age, was admitted into the Infirmary of the parish of St. George, Hanover Square, in the year 1808, on account of a disease of the spine. At this time, the upper part of the spine was bent forward, and the spinous processes of some of the dorsal vertebræ formed a preternatural projection at the posterior part; but still she was able to walk without assistance.

Soon after her admission an abscess presented itself, and burst in the groin; and this was followed by a second abscess, which burst near the former.

The child was now under the necessity of being confined entirely to her bed. The abscesses continued to discharge pus. She became affected with hectic fever; nevertheless, more than two years elapsed from the time of her having been first admitted into the infirmary before she died.

The body was examined by Mr. Howship, to whom I am indebted for this account of the case. It was universally anasarcaous. The abdominal muscles were so wasted, that scarcely any vestige of them was perceptible. This probably arose from the circumstances of the child

having remained in bed for so long a time previous to her death, and having scarcely ever varied her position.

At the posterior part of the abdomen, there was a confused mass of soft substance, which proved to be the parietes of an abscess communicating with the orifices in the groin.

The bodies of the lowest dorsal and three superior lumbar vertebræ were found at the posterior part of the abscess, nearly consumed by caries. There were no remains of the intervertebral cartilages between the tenth and eleventh dorsal, nor of those between the third and fourth lumbar vertebræ. These intervertebral spaces were filled with pus; and the opposite surfaces of the vertebræ were carious, but only to a small extent. The central part of the intervertebral cartilage between the ninth and tenth dorsal vertebræ had been completely absorbed, and pus was found in its place. Externally to this, the concentric layers of elastic cartilage were entire, though somewhat altered from their natural appearance.

CASE LXVI.

Mr. M., a young man, in the summer of 1816, became affected with pain in his back, and general debility, which he attributed to his having lain on damp ground, while in the Island of Ascension, in the preceding March. In the begin-

ning of September he sailed for England, being compelled to return home, on account of the state of his health.

In February, 1817, he arrived in London; complaining of pain in the back, and numbness of the thighs. Soon afterwards, on examining the spine, it was observed that that part of it, which is formed by the dorsal vertebræ, was incurvated forward, and that there was an evident lateral incurvation also. After this, an abscess burst in one groin, and continued open, discharging a large quantity of matter. The lower extremities became imperfectly paralysed; he lay constantly on one side, with the thighs drawn forward, so that his knees nearly touched his chin, and never varied from this position. He lingered until the 10th of August, 1818, when he died.

On inspecting the body, I found an abscess, which occupied nearly the whole of the anterior surface of the spine, from the upper part of the posterior mediastinum as low as the pelvis, and which communicated with each groin, extending downwards in the direction of the *psoæ* muscles. In many parts, in consequence of the contact of the matter of the abscess, the bodies of the vertebræ, and even the heads of the ribs, were affected with a superficial caries.

There were no remains of the intervertebral cartilage between the fourth and fifth dorsal vertebræ, and the opposite surfaces of these two vertebræ were consumed by caries to some

extent, and hence arose the curvature of the spine forward; and they were consumed to a greater extent towards the left side than towards the right, which explained the lateral curvature.

The intervertebral cartilages between the eleventh and twelfth dorsal vertebræ had also entirely disappeared, and the opposite surfaces of these bones were in a state of caries; but this had not extended itself sufficiently to occasion any sensible loss of bony substance.

The intervertebral cartilages between the third and fourth, fifth and sixth, seventh and eighth, tenth and eleventh dorsal vertebræ, and also that between the twelfth dorsal and first lumbar vertebræ, were all in a perfectly natural state towards the circumference; but in the centre they were of a dark colour; and on the surfaces towards the bones they, as well as the bones themselves, were in a state of incipient ulceration, but without any appearance of pus having been secreted.

All the other intervertebral cartilages were, throughout their whole substance, in a natural condition; and the bones of the vertebræ everywhere had their natural texture and hardness. On laying open the theca vertebralis, the membranes of the spinal chord were found adhering together, behind the space between the fourth and fifth dorsal vertebræ.

CASE LXVII.

Francis May, thirteen years of age, was admitted into St. George's Hospital on the 24th of March, 1833.

He complained of severe pain in the back of the neck, in which situation there was much thickening, and some enlargement of the soft parts.

There was also an angular curvature in the situation of the seventh, eighth, and ninth dorsal vertebræ; and he complained of pain in this part of the spine. There was no loss of sensibility or power of motion in the limb, his general health was much impaired, and he perspired profusely day and night.

Two years and a half ago, after an attack of rheumatic fever, he complained of severe pain in the back, which continued for a month or six weeks, and then subsided. A year ago the angular projection of the spine was first noticed. Seven months afterwards he first complained of pain in the neck; at the end of another month the pain in the back (which had subsided) returned. This was followed by the bursting of an abscess of the nates, discharging a large quantity of offensive pus.

He was directed to remain altogether in the recumbent posture, and some tonic remedies, with diluted sulphuric acid, were prescribed. A

blister was applied to the back of the neck, which in some degree relieved the pain in this part.

May 6th, an abscess presented itself in the posterior part of the pharynx. It was opened on the 9th of May, and a small quantity of pus was evacuated.

Soon after this diarrhœa supervened, and the patient died on the 2d of June.

On dissection it was found that the cartilaginous surfaces between the atlas and dentata had been destroyed by ulceration. The cartilages of the joints between the occiput and atlas were partly ulcerated. The transverse ligament was destroyed. The odontoid process of the dentata was scabrous, and partially dislocated. The abscess of the pharynx communicated with the carious surfaces. There was a small quantity of fluid effused in the basis of the cranium, but the brain was free from disease.

The bodies of the eighth and ninth dorsal vertebræ were destroyed by ulceration. An abscess communicating with the carious surfaces of the seventh and tenth dorsal vertebræ extended downwards, first in the course of the psoas muscle, then backwards on the inner edge of the quadratus lumborum, and thence to the nates, where it had formerly burst.

The remaining vertebræ were of their natural texture and hardness.

The following case is of much interest, not only as it shows the effects produced by caries

of the spine, and the connection between this disease and that of ulceration of the cartilages of the hip; but also as affording an example of the cure of the latter disease, and cicatrisation of the ulcerated surfaces, under no other treatment than that of perfect rest in the recumbent posture.

CASE LXVIII.

Mary Price, sixteen years of age, was admitted into St. George's Hospital, on the 24th of December, 1828.

She complained of pain in the loins, which was aggravated by pressure made in the situation of the upper lumbar vertebræ, and by sitting erect.

She also complained of pain in the left hip, which was more severe during the night than during the day, and attended with painful startings of the limb. The pain extended from the groin downwards, and was aggravated by exercise, and by pressure on the great trochanter.

She was confined to her bed in the horizontal posture; and an issue was made with caustic in the left groin.

Under this treatment, the symptoms were almost entirely relieved. But she now began to complain of a cough, attended with pain in the chest, and difficulty in making a full inspiration. Soon afterwards she expectorated pus; and she died on the 18th of March, 1829.

On dissection, tubercles with a considerable abscess were found in the left lung.

There was a small abscess lying behind the left psoas muscle, which communicated with a space between the fourth and fifth lumbar vertebræ, formed by the ulceration of the intervertebral cartilages and the adjoining surfaces of the vertebræ. The bones of the vertebræ retained their natural hardness, but were of a pale colour, apparently in consequence of their possessing a somewhat smaller degree of vascularity than under ordinary circumstances.

In the left hip-joint the synovial membrane appeared to be a little more vascular than usual. In the neighbourhood of the insertion of the round ligament the cartilage of the acetabulum had disappeared, but it had been replaced by a membranous substance, adhering to what would have been otherwise an exposed surface of bone. In another spot, at the upper part of the acetabulum, the cartilage had also disappeared, and the bone itself had become exposed. The bone, however, was hard and compact, and rather more elevated than the bone in the neighbourhood, so as to justify the notion that it had become cicatrised after having been in a state of caries.

CASE LXIX.

Charlotte James, nineteen years of age, was admitted into St. George's Hospital on the 30th

of May, 1821. About a month before her admission she had experienced pain in the loins, which was relieved by cupping. At the time of her admission she had violent pain in the left lower limb, from the hip to the foot; soon afterwards she again complained of pain in the loins; and about the same period a tumour presented itself in the loins, on the right side. Her constitution also became affected with hectic symptoms.

On the 2d of June the tumour was punctured, and sixteen ounces of pus were evacuated. Another abscess presented itself in the groin.

The hectic symptoms continued; she gradually sunk, and died on the 3d of August.

On dissection, the bodies of the three or four inferior lumbar vertebræ were found preternaturally vascular, and of a dark, and almost black colour; but they retained their natural texture and hardness, and had undergone none of those changes which mark the existence of the scrofulous affection of the bones. The intervertebral cartilages were in a natural state; but the body of one of the vertebræ was superficially ulcerated for about the extent of a sixpence on one side, towards the posterior part. A large abscess communicated with the ulcerated surface, and occupied the situation of the psoas muscle of the left side, extending downwards to the groin.

CASE LXX.

Edward Griffiths, forty-five years of age, was admitted into St. George's Hospital, on the 15th of April, 1818, on account of an abscess, which presented itself in the left groin. He said that, about four months before his admission, he had been seized with pain in the loins, and that the tumour in the groin had appeared about six weeks after the commencement of the pain.

He was directed to remain constantly in the horizontal position; and in a short time the tumour formed by the abscess in the groin disappeared, and another showed itself over the left *os innominatum*. On the 15th of May, this abscess was opened, and about forty ounces of pus were discharged. After this, he gradually sunk, and died, worn out by a profuse suppuration, on the 19th of August following.

On dissection, it was found that the cancellous structure of all the dorsal and lumbar vertebræ was of a dark red colour, and softer than natural, so that they might be cut with a common scalpel, or even crushed by the pressure of the thumb and fingers.

The opposite surfaces of the bodies of the second and third lumbar vertebræ, and of the cartilage between them, at the posterior part, were extensively destroyed by ulceration. Anteriorly, the bones and the intervertebral cartilage were entire, and the latter was in a perfectly

natural state; but the bones throughout were of a dark and almost black colour.

On one side of the body of the twelfth dorsal vertebra, there was a small ulcerated spot, forming an opening, which extended itself into a small cavity in the centre of the bone. This bone was also of a black colour; but the intervertebral cartilages belonging to it, as well as the intervertebral cartilages connected with the other vertebræ, were in a perfectly natural state.

The abscess had originated in the carious surfaces of the second and third lumbar vertebræ, and had extended itself behind the left psoas muscle, as low as the upper and anterior part of the left thigh; where it made a turn backwards on the inside of the tendon of the psoas muscle, and thus made its way to the place where it was opened on the posterior part.

The ribs were throughout unusually vascular and brittle, so that they might be broken by the slightest force. There were vomicæ in the lungs, and tubercles in the liver.

CASE LXXI.

Henry Shaw, seventeen years of age, consulted Mr. Earle in November, 1816, on account of a complaint which had begun about three months before, and of which the following were the most remarkable symptoms:—

He had frequent attacks of pain in the head,

attended with giddiness. Occasionally he had fits, in which he was for a short time insensible, with a spasmodic action of some of the muscles of the neck. The right eye was amaurotic, and there was constant tinnitus aurium. His mental faculties were for the most part unimpaired.

By Mr. Earle's directions, he was cupped; purgatives were administered, and he was kept under the influence of mercury during six weeks, at the end of which time his symptoms had nearly disappeared.

About the end of May, 1817, he went on a visit into the country; and while there, he one day tripped and fell in crossing the room. Another set of symptoms now showed themselves, for which he was brought to London. At this time he had pain in the back and in the right side, shooting in the direction of the costal nerves. He was subject to severe cramps in the stomach; his bowels were irregular; and he breathed with difficulty. He had cramps in his lower limbs, and his locomotive powers were impaired, though there was no actual paralysis of the muscles. His general health was much deranged. On examining the spine, Mr. Earle discovered a curvature, of which the convexity was turned backwards, occupying about the three middle dorsal vertebræ; and this was attended with a considerable alteration in the form of the chest. He was now removed into St. Bartholomew's Hospital, where Mr. Earle directed him to remain constantly in the horizontal position,

and an issue was made with caustic on each side of the spine. In a short time he lost the cramps of his lower extremities; but his general health continued to fail, and the difficulty of breathing increased.

In the middle of December he quitted the hospital. The exertion of being moved seemed to aggravate the disease. He was seized with numbness of the left leg and thigh; the dyspnœa became worse; and he sunk and died in convulsions, on the 23d of December, 1817.

On dissection, the arachnoid membrane was found opaque and thickened. A large tumour, of almost cartilaginous hardness, was found in the anterior lobe, and a similar one in the posterior lobe, of the right hemisphere of the cerebrum; and a third tumour occupied the greater part of the right lobe of the cerebellum. The ventricles were distended with water.

The right lung was studded with tubercles, and adhered universally to the pleura costalis. There was a large abscess of the posterior mediastinum; at the bottom of which, the bodies of two of the vertebræ, together with the intervertebral cartilage between them, were found nearly destroyed by ulceration. The other intervertebral cartilages were in a natural state; but the bodies of the vertebræ were soft, and many of them were beginning to ulcerate. The ribs were porous, their cancelli being filled with a curd-like matter; and they were soft, so that they might be divided with a scalpel. Four of

the ribs were separated from their attachment to the spine, and were ulcerated as far as their tubercles.

It is unnecessary for me to adduce other cases of caries of the spine in which I had the opportunity of examining the appearances after death, and which did not essentially differ from those already related. The pathological history of the disease may be thus briefly recapitulated.

In some instances it has its origin in that peculiar softened, and otherwise altered condition of the bodies of the vertebræ, the appearance of which, in the bones belonging to other joints, has been described in the last chapter, and which seems to be connected with what is called a scrofulous state of constitution. In these cases ulceration may begin on any part of the surface, or even in the centre of the bone, but in general the first effects of it are perceptible where the intervertebral cartilage is connected with it, and in the intervertebral cartilage itself.

In other cases the vertebræ retain their natural texture and hardness, and the first indication of the disease is ulceration of one or more of the intervertebral cartilages, and of the surfaces of bone with which they are connected.

There is still another order of cases, but these are of more rare occurrence, in which the bodies of the vertebræ are affected with chronic inflam-

mation, of which ulceration of the intervertebral cartilages is the consequence.

In whichever of these ways the disease begins, if not checked in its progress, it proceeds to the destruction of the bodies of the vertebræ and intervertebral cartilages, leaving the posterior parts of the vertebræ unaffected by it; the necessary consequence of which is, an incurvation of the spine forward, and a projection of the spinous processes posteriorly.

At this period of the disease the membranes of the spinal chord sometimes become affected with a chronic inflammation, which may extend even to the spinal chord itself; and where there is much incurvation, the latter not only becomes incurvated with it, but actually compressed in such a manner as cannot fail to interfere with the due performance of its functions.

Suppuration sometimes takes place at a very early period; at other times, not until the disease has made considerable progress. The soft parts in the neighbourhood of the abscess become thickened and consolidated, forming a thick capsule, in which the abscess is sometimes retained for several successive years, but from which it ultimately makes its way to the surface, presenting itself in one or another situation, according to circumstances.

In the advanced stage of the disease, new bone is often deposited in irregular masses on the surface of the bodies of the neighbouring vertebræ, and where recovery takes place, the

carious surface of the vertebra above coming in contact with that of the vertebra below, they become united with each other, at first, by soft substance, afterwards by bony ankylosis. The disposition to ankylosis is not the same under all circumstances: it is much less where the bones are affected by scrofula than where they retain their natural texture and hardness; and this explains wherefore, in the former class of cases, a cure is effected with more difficulty than in the latter.

Occasionally, portions of the ulcerated or carious bone lose their vitality, and, having become detached, are found lying loose in the cavity of the abscess. It is scarcely necessary to add, that the existence of such exfoliations is of itself almost sufficient to preclude all chance of the patient's recovery.

The foregoing observations are intended to apply to cases of caries of the spine originating in the spine itself: but those who are engaged in investigating the morbid anatomy of these diseases, will find it necessary to distinguish between these and other cases, which may at first appear to be of a similar, but which are in reality of a different nature. The long-continued pressure of an abscess which has originated in the neighbouring soft parts; of an aneurism of the aorta; of a mass of enlarged lymphatic glands, or of any tumour; may produce ulceration of the bodies of the vertebræ: and here we find the intervertebral cartilages in general to be

very little, or not at all affected; so that they are left projecting nearly or quite of their natural size, while the bones themselves are in a great degree consumed. In such cases, where the spine is carious in consequence of disease beginning external to it, the symptoms are not the same as where it has begun in the spine itself. For the most part, the affection of the spine is not suspected during the patient's lifetime; and after death it is easy to trace the origin of the disease in the contiguous parts.

Not unfrequently, however, we find caries from disease of the spine itself complicated with caries from external pressure. For example, disease of the vertebral or intervertebral cartilages occasions caries; and this is followed by the formation of abscess. The matter having become accumulated in considerable quantity, the abscess occupies a large space, and, by its pressure on the surfaces of the vertebræ in the neighbourhood, causes an extensive caries of them far beyond the boundaries of the original disease.

No experience which I have had would lead me to believe that the vacant space in the bodies of the vertebræ, produced by the ulcerative process, is ever supplied by a fresh formation of bone. The cure is never accomplished, except by the two vertebræ which form the boundaries of the disease above and below becoming anchy-

losed, or united with each other. This process, however, is assisted by another, which causes a deposition of new bony matter, in irregular masses, on the surface of the spine, in such a manner as not only to strengthen the union of the diseased vertebræ, but also to extend the ankylosis to those vertebræ which are in the immediate neighbourhood.

I shall conclude this division of the subject which is before us with the history of a case which illustrates the effect produced by caries of the vertebræ when it affects the uppermost portions of the spinal column.

CASE LXXII.

In the summer of 1839 I was consulted with Mr. Nicolson respecting a young lady, seven years of age, who complained of pain and stiffness of her neck. We prescribed for her a course of blue pill with sarsaparilla; and she was supposed to have recovered. She went to Brighton, and returned apparently well in the following October.

She continued well until the 10th of February, 1840; when, having gone out in the evening in a carriage to see some illuminations, and being thus exposed to the night air, she complained again of pain in the neck. On the following day

she was seen by Dr. Chambers, who prescribed the remedies under which she had recovered formerly; but this time she derived no benefit from them.

In the early part of the ensuing spring she went on a visit into the country, but returned, in the course of a few days, with an aggravation of all her symptoms.

On the 6th of May, when I was again consulted, she complained of pain in the neck, but more especially on every attempt to move it, walking with great caution, and endeavouring to avoid the slightest jar. The pain in the neck was much increased by pressure made with the hand on the crown of the head. In bed she always lay with her right hand placed under her head to support it, and she breathed with difficulty.

She was directed to take three grains of the *Hydrargyrum cum cretâ* three times daily; but no amendment took place. She lost flesh and strength. On the 23rd of May her right arm became paralysed. On the following day the right leg was affected in the same manner. After another day the left arm and leg were paralysed also. The difficulty of respiration increased; and on the 31st of May she died. The pulse was frequent and small through the whole of the latter period of her complaint.

On dissection the brain was found in a healthy state, with the exception of a small quantity of serum in the ventricles. A considerable quantity

of lymph had been effused on the upper portion of the spinal chord, underneath the arachnoid membrane, and involving the origin of several nerves. On the outside of the corresponding portion of the dura mater there was a considerable quantity of pus and lymph, occupying the space between that membrane and the vertebræ. The articular cartilage between the *occiput* and the *atlas*, as well as those between the oblique processes of the *atlas* and *dentata* on the left side, were ulcerated so as to expose carious surfaces of bone. The synovial membranes of these joints were destroyed, and both joints communicated with a small abscess on the external surface of the vertebræ. On the right side the corresponding joints were similarly affected, the disease being, however, in a less advanced state. The transverse ligament of the *atlas* had disappeared, and the dura mater covering it had been destroyed by ulceration; so that the odontoid process of the *dentata* was denuded, and projected into the vertebral canal, pressing on the spinal chord. The bodies of the two superior vertebræ were softer than under ordinary circumstances; but the occiput was of its natural texture and hardness. The *ligamentum subflavum* between the *atlas* and *dentata* had disappeared. All the superior vertebræ of the neck were imbedded in lymph, which extended into the neighbouring cellular structure.

SECT. II.

On the Symptoms of Caries of the Spine.

It has been shown that in all cases the effect produced by caries of the spine is so far the same that it causes a more or less extensive destruction of the bodies of the vertebræ. It is plain, therefore, that, up to a certain point, there must be a resemblance in the symptoms by which the disease is indicated.

But it has been also shown that caries of the spine may be the consequence of different morbid conditions of the parts of which the spine is composed; and it is reasonable to suppose that there must be in different cases some difference in the symptoms corresponding to the nature of the original disease.

A still more marked difference in the symptoms is the result of the caries being situated in different parts of the vertebral column, and thus affecting different portions of the spinal chord, and different orders of nerves.

The principal symptoms by which the disease is indicated may be thus briefly enumerated:—

1st. Pain and tenderness in the situation of the carious vertebræ.

2dly. Curvature of the spine forward, with an

angular projection of the spinous processes posteriorly, the result of the bodies of the vertebræ having been destroyed, while the other parts of these bones remain entire.

3dly. Abscess commencing imperceptibly, but at last presenting itself as an external tumour.

4thly. Pains, loss of sensation, coldness, muscular spasms, and paralysis of the extremities.

5thly. Derangement of the functions of the various viscera, which are capable of being influenced by that portion of the spinal chord which is implicated in the disease.

But the whole of these symptoms are not met with in every instance; nor do those which actually exist always show themselves in the same order. They are modified and altered according to a variety of circumstances,—and to such an extent, that a history of them, which is applicable to one case, may be found to be wholly inapplicable to another. In fact, there is scarcely any disease which presents itself under a greater diversity of forms, or in which, in the early stages at least, so much experience and discrimination are necessary to enable us to form a right diagnosis.

In the majority of cases the first symptom which the patient notices is pain referred to that part of the spine in which the caries exists; at first trifling, but becoming more severe afterwards. The pain is aggravated by any sudden motion of the spine; by percussion, or by a jar communicated to it in any other way;

as by stamping on the ground, jumping, striking the foot accidentally against a stone, sneezing, or coughing. In the advanced stage of the disease the pain is sometimes so severe, and so easily induced, that the patient cannot bear the slightest movement. Yet, in other cases, there is sometimes no pain in the spine whatever, from the first access of the disease to its termination. I was consulted concerning a young gentleman, in whom, judging from the degree of distortion, I was satisfied that the bodies of not fewer than four or five of the dorsal vertebræ must have been wholly destroyed, and that the disease had been going on for several years; yet he had never been known to complain of pain; and the first circumstance which attracted the attention of the parents was the angular projection of the spinous processes. This patient ultimately died; and, on examining the body after death, a large abscess was discovered lying on the surface of the carious vertebræ. In another case, in which the disease was supposed to have been cured, and the patient had not experienced pain for the two or three preceding years, on examining the appearances after death, I found the bodies of the vertebræ still in a state of caries, and an abscess, containing not less than half a pint of matter, connected with them.

The distortion of the spine, which occurs in these cases, is of a peculiar kind. It is bent forward, so as to form an angle projecting posteriorly; and it is evident that this cannot hap-

pen without the destruction of the bodies of one or more of the vertebræ.

It is not less evident that the caries must have made considerable progress before this symptom shows itself; and, accordingly, we find that it has been preceded by more or less pain, referred to the affected part, during a period which varies from three months to two years, and which is sometimes even longer than this. I have already mentioned that there are exceptions to this general rule, but these are of rare occurrence; and where pain in the early stage of the disease is wanting, there is usually some derangement of the general health, weakness of the extremities, or other symptoms, showing that the patient labours under some kind of disease, without indicating its exact nature and locality.

In general, the curvature is at first only just perceptible, and, by degrees, it becomes more distinct. In one instance a young woman, who had made no previous complaints, immediately after some slight exertion, experienced a sensation as if something had given way in her back, and immediately afterwards lost the use of her lower limbs. This was followed by an angular projection of the spinous process of one of the inferior dorsal vertebræ, and a large abscess which presented itself on one side of the abdomen. The patient ultimately died. In another case, after the curvature had taken place, the form of it appeared to vary, in consequence

of the diseased vertebræ admitting of being moved to a certain extent on each other; these motions being attended with an increase of pain, both in the spine and in the lower extremities. The last-mentioned patient ultimately recovered.

A distortion of the spine, in the direction forward, may arise from other causes besides caries of the bodies of the vertebræ. On this subject I shall have occasion to offer some observations hereafter. At present it is sufficient for me to observe that in such cases the distortion is never angular, but in the form of a gradual curve, and that it may be thus distinguished from the change of figure, which is the result of caries. Nevertheless, I am satisfied that these two different kinds of distortion have been frequently confounded with each other, and that some of the cases which have been published as examples of caries of the spine, and in which it may, at first, be a matter of surprise that so complete and so speedy a cure should have been effected, have been in reality cases of an entirely different malady.

I have formerly shown that ulceration of the harder textures may make considerable progress in the joints of the extremities without suppuration. It is the same with caries of the spine. I have known as many as three bodies of vertebræ completely destroyed, and the disease to have lasted many years, without matter being formed: a fortunate circumstance for the patient, as the chance of his recovery is much greater

under these than it would have been under the opposite circumstances. We must not however, conclude, because no abscess has shown itself, that therefore no abscess exists. Frequently, in examinations after death, we find an abscess in connection with carious vertebræ, which had never presented itself externally, but which evidently had existed for a considerable length of time.

It is not uncommon to find caries of the vertebræ going on for two or three years before there are any certain indications of the existence of abscess. In one case, in which the disease was in the vertebræ of the loins, an abscess presented itself in the groin at the end of eight years; and in another case, in which the disease was situated in the dorsal vertebræ, the interval was still longer — not less than sixteen years. The formation of abscess is usually attended with some derangement of the general health, such as loss of flesh and muscular power; increased frequency of the pulse; a slight access of fever in the evening, followed by perspirations at night; occasionally, but rarely, rigors.

These symptoms may be in some degree relieved by the first bursting of the abscess; but when the daily discharge of matter has continued for some time, they recur in an aggravated form: the patient wastes under the influence of a hectic fever, and some kind of visceral disease supervenes, which proves the immediate cause of death.

The foregoing observations relate to cases of caries of the spine generally. We have next to consider the peculiar symptoms which it produces, accordingly as one or another part of the column of the vertebræ is affected by it.

When there is caries of the cervical vertebræ, the patient complains, in the first instance, of pain in the neck, which is aggravated by every motion of the head, and which is not unfrequently mistaken for the muscular pains and stiffness connected with what is commonly called a stiff neck from cold. The pain gradually increases, and, according to my experience, is for the most part more severe than when the seat of the disease is lower down in the spine. The pain is aggravated by pressure on the crown of the head, and by any motion of the head, in consequence of which the patient acquires the habit of supporting the head, especially in walking, or otherwise changing his position, by his two hands, one placed on each side. When, in the progress of the disease, the spine has become bent forward, the angular projection posteriorly is observed to be trifling, except where the lowest or seventh cervical vertebra is implicated in the disease, a difference which is easily explained by the greater length of the spinous process of the latter, as compared with that of the spinous processes of the vertebræ above.

Abscess connected with diseased cervical vertebræ usually presents itself among the muscles on the side of the neck. Occasionally it makes

its way forward, forming a tumour, which afterwards bursts into the pharynx. A case has been already mentioned in which matter was found covering the medulla oblongata; and in another case, in which I examined the body after death, the abscess had penetrated into the *theca vertebralis*, and the whole of the spinal chord, from one extremity to the other, was bathed in pus. At an early period of the disease the patient frequently complains of pains in the arms and shoulders, which, after some time, are followed by paralysis. The general course of the paralytic symptoms is, that both upper extremities are affected in the first instance, while the muscles which derive their nervous influence from the spinal chord below the disease remain subject to the will. In a still more advanced stage of the disease the paralysis extends to the muscles of the trunk and lower extremities. Sometimes, however, the course is different; and I have already described a case in which the right upper extremity was first paralysed, then the right lower, then the left upper, and afterwards the left lower extremity. As the disease goes on pains are referred to the abdomen, which becomes distended, and tympanitic, the bowels being at the same time obstinately costive. In all cases there is pain in the occiput and temples, which is, however, more severe when the disease is situated in the two or three superior vertebræ; and it is in these last-mentioned cases more especially that the patient is seen to support his

head by his hands, one placed on each side. Not unfrequently the transverse ligament of the second vertebra is destroyed, and the consequence is a dislocation of the odontoid process. Sometimes the dislocation is complete, and the patient, from the pressure made on the spinal chord, expires as suddenly as if the latter had been divided transversely. More frequently it happens that the displacement of the odontoid process is somewhat restrained by the pressure of the dura mater which lies over it. There is then some degree of pressure on the spinal chord, sufficient to excite irritation, but not to destroy its functions. Under these circumstances, the patient complains of increased pain in the head, followed by convulsions, stupor, dilated pupils, and other symptoms of effusion of fluid within the cranium; and, on examining the body after death, we find that such effusion has actually taken place, there being a collection of fluid in the ventricles, or in the base of the cranium, or in both of these situations.

In cases of caries of the superior dorsal vertebræ, independently of the usual pain and tenderness of the affected parts, the patient complains of pain and a sense of constriction of the chest; and when the disease is in the inferior dorsal vertebræ there is a similar sensation in the epigastrium, pain in the abdomen generally, and a disturbed state of the functions of the alimentary canal. Occasionally the urine is alkaline, or it contains albumen, being voided without its

natural transparency, and becoming opaque on exposure to heat, or on the addition of nitric acid. From this last circumstance, and from there being at the same time pain either in or near the region of the kidney, it is sometimes difficult, in the first instance, to determine whether the patient labours under caries of the spine or disease of the kidney.

When the spine is incurvated forward, in consequence of the destruction of the bodies of the dorsal vertebræ, the angular projection behind is more distinct than it ever is when the disease has attacked the vertebræ of the neck or loins. This is to be attributed to the greater length of the spinous processes in this part of the spine, and to the circumstance of their being, in the ordinary position of the parts, inclined more or less downwards. When the curvature is considerable the thorax becomes at the same time altered in figure. The diameter of the thorax, from above downwards, is rendered shorter, while the other diameters are increased; so that, while the figure of the chest is altered, there is but little difference in its actual capacity. If, under these circumstances, an opportunity should occur of examining the appearances after death, we find a change in the position of the viscera corresponding to the altered form of the cavity in which they are contained. This is most apparent in the descending aorta, which is seen taking a spiral instead of its usual straight course on the fore part of the spine. When the superior

dorsal and inferior cervical vertebræ are both implicated in the disease, a large protuberance presents itself between the superior angles of the scapulæ, and the neck appears shortened, as if it had descended or sunk between the shoulders.

As the disease advances, the patient, in some instances, complains of pains, which are referred to one groin and hip, such as may lead to the suspicion that there is disease in the hip-joint; and, in fact, it is a very common error (and one into which even surgeons of great experience are liable to fall) to regard the symptoms of caries of the middle and inferior dorsal vertebræ as indicating incipient caries of the hip. Afterwards there are pains, combined with a sense of constriction, in the legs and thighs. The muscles are found to be not properly under the dominion of the will, so that the patient occasionally loses a step, or trips in walking, and this is probably followed by a complete loss of voluntary power. In some cases the paralysis is so complete that the muscles of the lower extremities never act under any circumstances: while in others, although they do not act under the influence of volition, they are subject to spasmodic and in some instances to permanent contractions.

Occasionally the loss of voluntary power over the muscles is attended with a total loss of sensibility; but more frequently while the former function of the nerves is destroyed, the latter remains but little or not at all impaired.

Paralysis of the bladder, and incontinence of the urine and fæces, sometimes exist in combination with paralysis of the lower limbs, forming a most distressing addition to the patient's other calamities.

A considerable time generally elapses before abscess connected with caries of the dorsal vertebræ presents itself externally. Sometimes it shows itself on the posterior, or lateral, or even on the anterior, part of the chest, having penetrated through one of the intercostal spaces. More commonly it makes its way downwards through the posterior mediastinum, behind the small muscle of the diaphragm; and then, taking the course of the *psoas* muscle, passes behind the crural arch, and appears in the anterior and upper part of the thigh. It is not uncommon for the abscess to form a large tumour on one side of the abdomen, occupying the whole, or a great part, of the space between the false ribs and the groin, pushing the viscera to the opposite side, and, at last, making its way to the surface, either through the abdominal muscles, or under the crural arch. But a very great length of time may elapse before it reaches this termination. I have known such an abscess to remain neither increasing nor diminishing in size, nor being materially changed in its situation, for several successive years; in some instances forming a soft and compressible tumour, in which the fluctuation of matter was distinctly perceptible; in others, having the character of an irregular

mass of solid substance, in which no fluid could be detected by the touch. Inexperienced surgeons not unfrequently mistake an abscess, under these last-mentioned circumstances, for an encysted tumour, or some other morbid growth.

When the lumbar vertebræ are affected with caries, the patient usually complains of pain in the region of the loins; which is aggravated by stooping, turning the body suddenly round, or by percussion. Sometimes the pain is confined to the vertebræ themselves; while at other times it extends forwards, in the direction of the lumbar nerves, to the sides of the abdomen and the *crista* of the ilium.

When abscess is formed, it usually either descends in the direction of the *psoas* muscle, and presents itself behind the crural arch in the upper and anterior part of the thigh, or otherwise makes its way backwards on the outer edge of the *quadratus lumborum* and *sacro-lumbalis* muscles, showing itself on one side of the loins. In some rare cases, it takes the course of the spermatic chord, and forms a tumour protruding through the abdominal ring, such as a superficial observer might easily mistake for a hernia; or it descends into the pelvis, and afterwards into the posterior part of the thigh, following the direction of the sciatic nerve, through the sacro-sciatic notch of the pelvis. Occasionally it reaches this last-mentioned situation in another way. I have known an abscess to have descended from the

loins, and presented itself as a tumour in the groin. Suddenly the tumour has disappeared, and the patient has been led to entertain hopes of a speedy recovery. But these have been soon disappointed, in consequence of the discovery of a large collection of matter in the posterior part of the limb, behind the little trochanter of the femur. In a case of this kind, in which I had the opportunity of examining the morbid appearances after death, I found that the abscess had taken the course of the common tendon of the *psoas magnus* and *iliacus internus* muscles to their insertion into the bone, afterwards extending further backward, below the inferior edge of the *quadratus femoris*.

I may take this opportunity of observing, that it is by no means uncommon, whatever part of the spine may be the seat of caries, to find an abscess thus altering its course, disappearing in one place, and some time afterwards appearing in another: and this seems to afford a reasonable explanation of some of those cases in which it has been supposed that an abscess has been suddenly removed by absorption.

It very rarely happens that this disease, when confined to the loins, proceeds so far as to occasion any perceptible alteration in the figure of the spine: and this peculiarity is easily explained by the greater magnitude of the bodies of the lumbar, as compared with those of the cervical or dorsal vertebræ, in consequence of which the

former are not destroyed by the same extent of caries which would be sufficient for the destruction of the latter.

The same circumstance will also, in great measure, account for another peculiarity of this disease, when it affects the lower portion of the spine, namely, the absence, in the majority of cases, of pains, muscular spasms, paralysis, and loss of sensibility in the lower limbs. In fact, in these cases it seldom happens that the caries extends so far as to reach the *theca vertebralis*. In one case, in which the patient had complained of numbness of the legs and thighs, I found, on dissection, that the *theca vertebralis* was in no part exposed; but that there was a large abscess on each side surrounding the lumbar nerves, and thus explaining the diminished sensibility of the parts to which these nerves were distributed.

In systematic works on surgery the lumbar or psoas abscess is usually described as if it were (in some instances at least) a specific or primary disease, having its origin in the *psoas* muscle. But, according to all the experience which I have had of these cases, this is altogether a mistaken view of the subject. I cannot say that such an abscess never takes place in the loins; but I certainly believe that it is of very rare occurrence. In examining cases of lumbar abscess after death, I have always found caries of the vertebræ, in which the abscess has manifestly originated. In general the disease of the vertebræ has been so obvious, that it could not

have been overlooked by the most superficial observer; but, in some instances, the real nature of the disease has not been detected until after a careful dissection. In one instance, on examining the body of a patient who died in St. George's Hospital with an extensive suppuration in the loins, the soft parts having been entirely removed, not the smallest appearance of disease presented itself in the lumbar vertebræ, and I conceived that I had at last met with a case of genuine psoas abscess; when, almost accidentally, a small opening was discovered on one side of the spine, in a part which had been covered by one of the attachments of the *psoas* muscle, just large enough to admit a common probe, and forming a communication between the cavity of the abscess, and one of the intervertebral spaces. On a further dissection, it was ascertained that the intervertebral cartilage had been completely destroyed by ulceration, except at its circumference, and that the opposite surfaces of the bodies of the two contiguous vertebræ were extensively carious.

Another question still remains to be considered:—

Are there any circumstances by which in the living person we may distinguish from each other the different forms of caries of the spine, according to the different morbid condition of the bones

and intervertebral cartilages in which the disease has its origin ?

My experience leads me to believe that we may do so, but only to a limited extent : that in some cases we may make a nearly certain diagnosis, and only a doubtful one in others.

Caries which has its origin in a scrofulous condition of the bones, for the most part occurs in young persons under, or not much exceeding, the age of puberty, having what is called a scrofulous aspect, and not unfrequently has been preceded by scrofulous enlargement of the lymphatic glands, or scrofulous disease of one or more of the joints of the extremities. In such cases the pain in the affected portion of the spine is generally trifling, and sometimes none at all, except when specially induced by jumping or some other sudden concussion. I have known very many cases in which a young patient has never complained of pain, nor has the existence of disease of any kind been suspected, until the mother or the nurse has discovered an angular projection of the spinous processes indicating that the caries had already made a very considerable progress. In a case to which I have already alluded, which I had the opportunity of watching for some years, and in which the spine was distorted to a very unusual extent, with a large abscess in the abdomen ; the patient suffered so little pain or other inconvenience, that several practitioners who were at different times consulted were led to the conclusion that no caries

existed, and that the alteration in the figure of the spine depended on some other cause. One surgeon had actually recommended a course of gymnastic exercises for the purpose of rectifying the deformity. At last the death of the patient, and the examination of the body afterwards, proved the correctness of my diagnosis.

In a case of scrofulous caries of the spine I doubt whether the patient ever escapes the formation of abscess. At any rate, such an event is of very rare occurrence. I know that patients sometimes appear to recover without abscess having shown itself, in whom an abscess exists nevertheless, in what may be called an inactive state, and I have already referred to cases which confirm this observation. If under these circumstances the opportunity presents itself of examining the parts by dissection, the parietes of the abscess are found consisting of a dense solid mass adhering to the spine above and below the parts destroyed by the caries, while the contents of it are converted into a thick cheesy matter in consequence of the absorption of the thinner part of the purulent secretion.

In those cases which are not of scrofulous origin,—that is, not preceded by the scrofulous change in the organization of the bones,—the patients are generally advanced beyond the age of puberty. Many of them have been previously subject to some form of rheumatism; and from this and other circumstances I am led to believe that the caries may frequently be referred to

chronic rheumatic inflammation affecting the bones and intervertebral cartilages. Occasionally nodes on some of the cylindrical bones have preceded the vertebral disease. In such cases the pain in the spine is often very severe, and the patient's sufferings are greater than in those of the truly scrofulous disease; but I am inclined to believe that there is a much greater probability of the patient recovering without the formation of abscess,—a circumstance of great importance, as it justifies, for the most part, a more favourable prognosis.

In all cases of caries of the spine there is some difficulty in making a positive diagnosis in the early stage of the disease, previously to the appearance of angular curvature. The disease being for the most part confined to the bodies of the vertebræ, and these being at a considerable distance from the surface of the body, there is generally no external tenderness. Innumerable mistakes have been made, and many individuals have been condemned unnecessarily to a long-continued surgical treatment, in consequence of the surgeon examining the spine with a view to discover the last-mentioned symptom. There is scarcely any delicate young woman, especially among those belonging to the (so called) better classes of society, who will not complain of some parts of the spine being tender if it be firmly pressed; and in any thin person, of either sex, pain will be produced by pressing the skin against the projection of the spinous processes. Instead

of trusting to such a mode of examination, it is best to place the patient standing on a chair or table, and desire him to jump off of it on the ground; and I believe that where caries exists, it may generally be detected by the effect produced by this kind of concussion.

SECT. III.

Treatment of Caries of the Spine.

THE rule which was laid down as to the treatment of diseased joints of the extremities are not less applicable to all cases of caries of the spine. As far as that can be accomplished, the diseased parts should be kept in a state of absolute and complete repose. While the patient is in the erect posture, and the weight of the head and other superincumbent parts is pressing on the ulcerated surfaces, and while these are liable, in the various motions of the body, to a constant (however trifling) friction, it is not probable that the progress of ulceration can be checked, or that suppuration can be prevented. From the first moment therefore in which the nature of the case is clearly indicated, the patient should abandon his usual habits, and be confined altogether on his bed or couch. In some instances, in which severe pain in the vertebræ is among the early symptoms of the disease, he will submit to the privations which are thus imposed upon him with sufficient willingness; while in others, nothing but a candid exposition of the ill consequences which may otherwise arise, will overcome his reluctance to do so. The invalid bedstead, contrived by Mr. Earle, and which I

have formerly mentioned, will, in ordinary cases, afford the most convenient means of conducting this part of the treatment. The manufacturer of the bedstead has lately added to it what, with such experience of it as I have hitherto had, I am led to regard as a very great improvement. Instead of a board, or canvas, that portion of the mattress which corresponds to the head or trunk of the patient is supported by vulcanised India-rubber, perforated with holes so as to prevent the accumulation of damp from perspiration. This has most of the advantages which belong to the water-bed, and is without some inconveniences to which the latter is liable, where the patient can never be moved from it.

By the use of the invalid bedstead the patient is enabled to obtain some change of position ; as the trunk and thighs may be, from time to time, and within moderate limits, raised or lowered, so that their relative position may be varied without the smallest movement being communicated to the carious vertebræ. He may also be wheeled from one room into another, or into the open air, in fine weather. As a general rule it is better that he should be in the supine posture, lying on his back ; but he may occasionally relieve himself by lying on his side. On no account should any attempt be made, either by laying the patient on his back, on a flat board, or by the application of machinery, to remove the angular curvature, so as to restore the spine to its original shape. Without such undue interference on the

part of the surgeon, the carious surface of the vertebra above will always come in contact with that of the vertebra below; and it is to the union which takes place under these circumstances, at first by soft substance, and afterwards by bony matter, and to this alone, that we are to look for the patient's recovery. Whatever disturbs this process (and any attempt to straighten the spine cannot fail to do) must therefore be carefully avoided.

The recumbent position does not constitute the only means which we have in our power to employ for the purpose of maintaining the diseased spine in a state of perfect repose. When the disease is situated in the dorsal or lumbar vertebræ, the patient may be provided with a bandage, including some stripes of whalebone, and somewhat resembling the stays worn by females, but extending as low as the symphysis of the pubes, the os sacrum, and the great trochanter, and as high as the neck. This will operate like splints, keeping the pelvis and thorax in the same relative position. A less efficient support may be given to the cervical vertebræ by means of an air-cushion, or a bag of India-rubber partially distended with water, placed so that the occiput and neck may rest upon it.

Under certain circumstances, the prone couch contrived by the late Mr. Verrall may be useful, by affording the patient the relief arising from a change of posture. But it should be used only

occasionally, as, in young persons especially, the constantly lying on it for any considerable length of time is liable to produce a very perceptible flattening of the anterior part of the chest.

In the early part of my professional life, I was led to follow the practice which was then very generally adopted of treating caries of the spine by means of setons and caustic-issues, one on each side of the diseased vertebræ. A more enlarged experience has satisfied me that, in the very great majority of cases, this painful and loathsome mode of treatment is not only not useful, but actually injurious. The observations which I made on this subject formerly, with reference to scrofulous diseases of other joints, are equally applicable to cases of scrofulous diseases of the spine. For many years past I have ceased to torment my patients who were thus afflicted in this manner, and I am convinced that the change of treatment has been attended with the happiest result. There are a few cases only in which I am still inclined to believe that issues or setons may be employed with advantage. The cases to which I allude occur almost exclusively in adult persons, where there is severe pain in the seat of the disease, and where from this and other circumstances we are justified in the conclusion that the caries depends, not on a scrofulous condition of the bones, but on disease of the intervertebral cartilages, or a chronic inflammation, probably of rheumatic origin, of the vertebræ themselves. Even in these last-mentioned

cases issues and setons do not seem to form any necessary part of the treatment; and I am not myself in the habit of resorting to them unless I find that the pain is not relieved by the recumbent posture, and the other remedies of which I shall speak presently. It appears to me also, that in cases of caries of the spine, as well as in those of caries of other joints, issues and setons are to be employed only in the early stage of the disease, and that no advantage is to be expected from them after abscess is formed.

An important question here presents itself, — For how long a period is the patient to be confined to the recumbent posture? If there be a reason for it being had recourse to at all, there is also a sufficient reason for it not being abandoned for many months. In the great majority of cases it should be extended to a year, or a year and a half; and where the disease has made extensive progress, even to two or three years.

In the first instance, the surgeon usually finds it difficult to persuade the patient to continue this part of the treatment for a sufficient length of time after the removal of the more urgent symptoms. Afterwards, however, he often has to encounter a difficulty of an opposite kind. This happens especially among young females, who become at last so habituated to their couch, and the peculiar mode of life connected with it, that they can scarcely be persuaded to make the necessary effort to sit up and move about, even after every reason for not doing so has vanished.

I have on a former occasion referred to the case of a lady who, under these circumstances, preserved the recumbent position for such a length of time that all the joints of the lower extremities, in which no actual disease ever existed, from mere want of use, became completely ankylosed. Various attempts were at last made to restore their mobility, but to no purpose, and she still remains in the same condition as when I was first consulted, twenty years ago, — unable to use her lower limbs, or even to sit up.

Although the maintenance of the recumbent posture may be regarded as absolutely necessary, it is not on this alone that the surgeon should depend for the patient's cure. Attention must be paid to his general health; and, accordingly as the disease presents one or other character, or as the constitution varies, different modes of constitutional treatment will be required.

Where there is an evident scrofulous diathesis, (and in children generally), preparations of iron may be exhibited; and these may be made to alternate with the cod-liver oil, or sarsaparilla, or some of the ordinary tonics. The diet should be simple and nutritious; the bowels should be carefully regulated, and it will generally be necessary, from time to time, to stimulate the action of the liver by small doses of the *hydrargyrum cum cretâ*, or even of calomel. It is scarcely necessary to add that in the majority of such cases a residence on the sea-coast will be highly beneficial.

In other cases, where it is plain that the disease is not of scrofulous origin, and where there seems to have been no particular vice of the constitution previous to the occurrence of the local disease, mercury may often be administered with the best result; and it is especially useful when the patient suffers a more than usual degree of pain. It may be given in the form of the bi-chloride, or calomel combined with opium, or the common mercurial pill, so as slightly to affect the gums, for three or four weeks, and sometimes for a still longer period; and this may be followed by a course of well prepared decoction of the best Jamaica sarsaparilla, in as large doses as can be conveniently taken. In other cases in which there seems to be sufficient reason for avoiding the use of mercury, sarsaparilla may be prescribed in the first instance, the course of it being continued two or three months, and repeated some time afterwards.*

With respect to the treatment of abscesses connected with caries of the spine, I am not

* No one who has seen the above-mentioned remedy properly administered can doubt the great efficacy of it in certain cases of disease of the bones and periosteum, as well as in many cases of cachexia, especially that arising from the joint operation of syphilis and mercury. The doubtful reputation which it has obtained with some practitioners is, I apprehend, to be attributed to its being so frequently employed in other cases in which it has no specific influence, to the inferior quality of the drug, or to its being given in insufficient doses.

aware of any circumstances in which it should differ from that of abscesses connected with other joints affected by the same disease. The patient should not venture to take exercise, nor even to quit the recumbent posture until the abscesses are healed. This is to be regarded as the general rule; from which, however, on a very few occasions, it may be right to deviate. I was consulted by a gentleman who was at that time thirty-five years of age, and who had laboured under well-marked symptoms of caries of the spine since he was three years old. There was considerable curvature in the direction forward, with an angular projection of the spinous processes of the middle dorsal vertebræ posteriorly; and there were two sinuses, discharging pus, communicating with the carious vertebræ, which had existed for nearly thirty years. Nevertheless, the patient had been able to take violent exercise in hunting and shooting, and other ways, and his general health had been excellent. In fact, he had suffered no material inconvenience from his complaint, except that he once lost the use of his lower limbs; recovering it, however, completely at the expiration of three months, and after the application of blisters to the back.

No one who has been much conversant with cases of caries of the spine, can fail to regard it

as a most serious disease, of which, even in the more favourable cases, it is impossible to form more than a doubtful opinion as to the result. Nevertheless, in those cases in which the patient is so situated that he can have the advantages of wholesome diet, fresh air, and the necessary surgical attention during the long period which is necessary for a cure, a cure will often be accomplished. Many children recover even after the formation of extensive abscesses. The worst cases are those of adults, in which the disease is of scrofulous origin, and complicated with abscess. But even such cases, if the general health can be maintained for a certain length of time, are by no means to be regarded as hopeless. In the year 1829 I was consulted concerning a young gentleman who laboured under a scrofulous disease of the knee. The structure of the joint was wholly destroyed, and I concurred with his other surgical attendants, in recommending the amputation of the limb, which operation was accordingly performed by an eminent provincial surgeon. Some years afterwards the patient, now a young man, called on me at my own house, to consult me as to an enormous swelling of one leg and thigh. On making my inquiries I found that he wore a broad belt, fastened tight by buckles round the waist. He told me that he wore it because without it there was a great swelling in one loin. The swelling proved to be an enormous abscess connected with disease of the lumbar vertebræ, such as might be well supposed

to contain two pints or more of pus. The pressure of the belt on this abscess, by preventing it from protruding externally, caused it to impede the return of the blood by the iliac vein, and thus occasioned the swelling of the lower extremity. On removing the belt the tumour in the loin immediately increased in size, and the leg and thigh were reduced nearly to their natural dimensions. By my advice the patient retired to a healthy spot on the sea-coast in South Wales, where he resided in a cottage fronting the sea. Here he lay on a couch exposed as much as possible to the sea air, the abscess being opened some time afterwards by a surgeon in the neighbourhood. At the end of a year the abscess was healed, and he ultimately recovered. I have since seen him at various times in perfect health, and I have no reason to believe that he is otherwise than well at the present time. I mention the case, because the circumstance of the disease in the vertebræ having supervened on a disease of the knee so extensive as to require amputation, had led me in the first instance to regard it as almost hopeless.

Paralysis of the muscles below the seat of the disease must always be regarded as an unfavourable symptom. Yet, in many instances, after being for some time in the recumbent posture, the power of the will over the muscles begins to be restored; and I have known children, in whom the muscles of the lower limbs had been completely useless, after the lapse of three or four

years, to be able to walk and run and jump as well as if they had never laboured under any kind of disease. In one case, indeed, where a little girl had in other respects perfectly recovered from the effects of caries of the upper dorsal (and probably of the lower cervical) vertebræ, she was nevertheless unable to support the weight of the head without the aid of a machine. When this was taken off, the patient being in the erect position, the head fell forward, so that the chin rested on the sternum. I suspect, however, that in this case the inability to keep the head erect depended on the altered position of the centre of gravity consequent on the spinal curvature, and not on actual paralysis.

SECT. IV.

On some Cases which are liable to be mistaken for those of Caries of the Spine.

HOWEVER difficult it may sometimes be to recognise the existence of caries of the spine in the earliest stage of the disease, there is no difficulty in doing so when the disease has gone so far as to produce any considerable destruction of the bodies of the vertebræ. The spine is then bent forwards, the spinous processes in the situation of the disease making an angle projecting posteriorly, and varying, as I have already explained, according to the extent of the caries, and the length and position of the spinous processes. Such an angular curvature can be produced in no other way, and can never be mistaken.

The common lateral curvature of the spine, from whatever cause it arises, is so different from the alteration of figure produced by caries, that it would be but a waste of time to explain the circumstances by which it may be distinguished. But there are other cases in which the spine is incurvated forwards, which have been not unfrequently mistaken for cases of caries, and in which, therefore, it seems important, with a view to a better diagnosis of the last-

mentioned disease, that I should offer some observations.

In the cases to which I allude, the spine is bent forwards, not, however, presenting an angle posteriorly, but in such a manner as to form a gradual curvature or arch, including several, and sometimes nearly the whole of the column of the vertebræ. The late Mr. Earle first called the attention of the profession to this subject in a paper in the 11th volume of the *Edinburgh Medical and Surgical Journal*, and pointed out the importance of distinguishing this, which he called the hoop-like curvature of the spine, from the angular curvature produced by caries.

The hoop-like curvature may arise under various circumstances. Mr. Earle has described cases in which “the whole vertebral column was slightly arched in the form of a half-hoop,” — this being the result of the muscles not having sufficient power to preserve the spine erect. In these cases the muscles of the limbs generally were weak; and in one case Mr. Earle, having had the opportunity of examining the body after death, ascertained that there was no disease whatever in the vertebræ, while there was considerable disease in the membranes of the spinal chord. I have notes of a case in some degree analogous, by which I was myself misled in the early part of my practice. The patient was a little girl, who had been for some time weak and drooping, with an indisposition to use her lower limbs, and a gradual curvature affecting the lumbar

and inferior dorsal vertebræ. With such knowledge as I then had on the subject, I was led to recommend the recumbent posture, and to establish an issue with caustic on each side of the back. About three weeks afterwards, well marked symptoms of cerebral disease showed themselves, which in the course of a few days terminated in the patient's death. On the body being examined, I found no unusual quantity of fluid in the ventricles, but a very turgid state of the vessels of the brain, and no caries of the vertebræ.

A similar curvature of the spine occurs in some cases of rachitis, and here it may be distinguished by the alteration of shape in the other bones with which it is accompanied, especially in those of the lower limbs and the chest.

The long continuance of a stooping posture will produce the same effect. My friend the late Dr. Potts gave me the opportunity of examining a dry preparation of a spine in his possession, in which the hoop-like curvature exists in a very remarkable degree. It was taken, as Dr. Potts informed me, from an insane patient who died in the Hôpital Bicêtre at Paris, and who had remained constantly in one position, bent forwards and almost immovable during a very long period of time. In this instance the bones are deficient in earthy matter, but not more so than is accounted for by the circumstance of the patient having been in a state of total inaction probably for many years.

Some persons, either from their original conformation, or from an early habit of stooping, present the appearance of a very considerable gradual or hoop-like curvature affecting the lower cervical and upper dorsal vertebræ; and this peculiarity of shape generally increases as they advance in life. In such persons the projection made by the long spinous process of the seventh cervical vertebra may, by a superficial observer, be mistaken for the angular curvature of caries. Such a mistake is most liable to occur in cases of women in whom the neck is exposed, and I have known it to be actually made in more than one instance; thus causing the patient to experience much unnecessary trouble and anxiety.*

Every one who is conversant with patho-

* It is not my object here to treat of the hoop-like curvature of the spine, except so far as it may be considered in its relation to the angular curvature from caries. The inquiry, however, is one of much interest, and well deserves to be prosecuted farther. Although, under ordinary circumstances, this kind of curvature is certainly not productive of any very serious inconvenience, I have some reason to believe that when it exists in a great degree, it may ultimately so interfere with the functions of the spinal chord so as to become a very serious and even dangerous disease. The evidence which has led me to this remark is not sufficiently complete for me to be justified in laying it before the profession: It may become so hereafter: and in the mean while I avail myself of this opportunity of calling the attention of other practitioners to the subject.

logical museums must have seen specimens in which the bodies of a greater or smaller number of vertebræ are firmly ankylosed, there being at the same time a deposit of bony matter here and there on the surface adhering to the bone beneath, and extending from one vertebra to the other. It is reasonable to suppose that such a change in the condition of the spine must have been the result of a long-continued chronic inflammation; but in no instance in which I have had the opportunity of observing these morbid appearances, have I been able to ascertain what were the symptoms by which the existence of the disease had been marked in the living person.

Some cases, however, have come under my care, in which such were the symptoms under which the patient laboured that they seemed to admit of no other explanation than that of attributing them to the above-mentioned disease. The progress of the disease was tedious, extending, when I had the opportunity of watching it, over a period of several years, and it terminated in leaving the spine of its natural figure, but completely rigid and inflexible through the greater part of its extent.

The following history will sufficiently explain the circumstances by which this disease is to be distinguished from caries of the spine, and the treatment which I have been led to adopt with a view to its relief.

CASE LXXIII.

August, 1841. A gentleman, thirty-one years of age, consulted me under the following circumstances:—

He complained of pain referred to the spine from the neck downwards, but especially to the middle dorsal vertebræ. When he attempted to stoop, he experienced a sense of stiffness of the spine, and there was scarcely any perceptible flexure of it, the stooping being apparently confined to the motion of the pelvis on the thigh. A sudden motion had often occasioned an aggravation of the pain in the spine, and on all occasions pain was induced by the act of sneezing, which therefore he carefully avoided. He also experienced at times pains in the pelvis and lower extremities. There was no pain in the head or upper extremities. He was prevented taking exercise in consequence of the pain which it induced; but I could not find that there was anything like paralysis of the limbs, and there was no difficulty of micturition. There was some effusion of fluid in the right knee, as in cases of inflammation of the synovial membrane. He had lost flesh considerably; but his pulse was natural, his bowels were regular, and there were no signs of other disease. He suffered during the night from spasmodic twitches of the lower limbs disturbing his rest.

He had come to England, on account of his

complaint, from the Mediterranean, where he had been resident for some years. He said that the symptoms had begun three years ago, almost imperceptibly. The first of these which attracted his notice was a pain in the back, induced by sneezing. From that time they gradually increased, varying, however, in degree at different periods. He had had some attacks of intermittent fever, each of which was followed by an aggravation of his other complaint.

I prescribed a pill of two grains of calomel with one-third of a grain of opium, to be taken three times daily; and rest in the recumbent posture.

On the 1st of September, the mercury had not affected the gums, but his symptoms were much relieved. He seemed to have gained flesh, and had a more healthy aspect, and the pains and spasms had ceased. The mercury was now omitted, and a course of a strong decoction of sarsaparilla was prescribed in its place.

After an interval of a month, being threatened by a recurrence of some of his former symptoms, he was advised to omit the use of the sarsaparilla, and to resume the use of some mercurial remedies, but in smaller doses than before. The mercurial treatment was continued (some other remedies being from time to time combined with it, to meet occasional symptoms) until the 7th of December. At that time he had none of his former symptoms, except some occasional spasms

in the muscles of his lower limbs, and these to a much less extent than formerly. I advised him to take moderate doses of the iodide of potassium, but it disagreed with him, and was therefore discontinued.

He was now compelled by circumstances to return to Malta; and I therefore lost sight of him until the following August (1842), when he was again in England. He was now much improved in all respects; but as he complained of some degree of pain in the back, I prescribed another alterative course of mercury. Under this a further improvement took place, the spine, however, continuing in the same rigid and inflexible state as formerly. In the course of the autumn he was compelled again to return to Malta. From thence I received the following account of him, dated January 28. 1843:—"I am happy to say that the long journey (overland through France) caused no fatigue. He has been much benefited by the fine weather which we have had. To-day he has walked two miles without resting, and without the least fatigue."

August, 1844, he was again in England, suffering little or no inconvenience, except from the rigidity of the spine, which remained as it was formerly.

From this time I have had the opportunity of seeing my patient from time to time. He has occasionally suffered from inflammation of the eye, and some other complaints, but has had no

return of his former symptoms. The state of the spine is unaltered.

Malignant diseases are occasionally met with in the spine. As might be expected, from the contiguity of the spinal chord and spinal nerves, the symptoms which arise in these cases are very different from those which mark the existence of similar diseases in the joints of the extremities, at the same time that they bear a certain degree of resemblance to those which occur in the advanced stage of caries of the vertebræ. For these reasons I have thought it better to reserve whatever I have to say on the subject to the present chapter.

The spine may be affected by carcinoma, or by the medullary or fungous disease, the former being more frequent than the latter.

The medullary disease may occur as a primary affection. But in all the cases in which I have known the spine to be affected by carcinoma, it has been preceded by the same disease in some other organ. It has generally followed carcinoma of the female breast. In one instance, however, the original disease was a scirrheus tumour of the nostril; and in another, which I have recorded elsewhere*, it was a schirrous enlargement of the prostate gland. The symptoms

* Lectures on Diseases of the Urinary Organs, 4th edition, page 209.

of the disease, in the first instance, are always equivocal; and in many instances there must be always more or less doubt as to its exact nature, until the opportunity occurs of ascertaining it by the examination of the morbid appearances after death. The difficulty of diagnosis, however, is of little importance, as such cases are unfortunately wholly beyond the reach of art. The two following histories will supersede the necessity of a more laboured description.

CASE LXXIV.

A lady, thirty-two years of age, consulted me in the spring of 1832, on account of a scirrhus disease of one breast. There was not a defined scirrhus tumour imbedded in the substance of the breast, but a conversion of the gland itself into the scirrhus structure. The skin covering the breast was thickened, and manifestly contaminated by the disease.

From this time I saw her occasionally, the disease in the breast making little or no apparent progress.

During the night of the 10th of February, 1833, she suddenly became paralytic in the whole of the lower part of her person. She not only lost the power of using her lower limbs, but also that of voiding her urine, so that it became necessary to empty the bladder by means of a catheter.

The loss of muscular power was attended with a loss of sensibility as high as the navel and lower dorsal vertebræ. When the catheter was used, she was not sensible of its introduction.

In the beginning of March the lower limbs became affected with involuntary convulsive movements, which were unattended with pain, but of which the patient complained that it was disagreeable to her to see them.

When the paralysis first took place, the urine was clear, and otherwise in a natural state. Afterwards it became ammoniacal and offensive to the smell, depositing a thick mucus, with traces of phosphate of lime in it.

On the 9th of April, 1833, the patient died.

The body was examined by Mr. Cutler, and presented the following appearances.

The entire gland of the breast had assumed the scirrhus structure.

Several of the dorsal vertebræ were converted into a substance possessing considerable vascularity, and of a gristly consistence, some of them containing no earthy matter whatever, so that they could be cut with a knife. Altogether the alteration in the condition of the vertebræ seemed to be very similar to that which had taken place in the head of the femur, in a case of which an account is given in a former part of this volume, except that, being more complete, it might be supposed to indicate a more advanced stage of the disease.

The whole of the lower portion of the spinal canal was filled with a serous fluid.

There was a deposit of earthy matter in the upper part of each lung, and about four ounces of serous fluid were contained in the cavity of the right pleura.

The kidneys were of a dark colour, and highly vascular.

The mucous membrane of the bladder bore marks of considerable inflammation. That of the ureters, pelvis, and infundibula of the kidneys was also inflamed, and in several places lined with coagulated lymph. These last-mentioned parts were considerably dilated, and contained a putrid mixture of pus and urine.

CASE LXXV.

A gentleman, thirty-nine years of age, consulted Mr. Tatum on the 15th of July, 1849, complaining of a severe pain referred to the right loin, and extending from thence down the outside and fore part of the thigh. The pain was aggravated by certain movements of the body, but there was no tenderness of the parts to which the pain was referred. The patient said that for some years past he had been subject to attacks of what he regarded as lumbago, and that the present attack of pain in the loins had begun a month ago.

Under the use of some remedies prescribed by

Mr. Tatum, it was supposed that there was some degree of amendment in the first instance. On the 24th of July, however, the patient was suddenly seized with pain in the loins, more severe than he had ever before experienced. On every attempt to move, the pain was intolerable, and it was with difficulty that he was placed in an easy chair. On the following day the pain was somewhat less, and he was moved to his bed. Simultaneously with this increase of pain in the loins, he complained of a sense of weight in the region of the cœcum and ascending colon. Some active purgatives were administered, and followed by an enema with oil of turpentine. This produced the discharge of an immense mass of indurated fæces. Other discharges of the same kind took place afterwards, but without being followed by any relief as to the principal symptoms. On the 10th of August there was a difficulty in moving the left leg: and in the course of two or three days more both of the lower extremities were completely paralysed. He was now directed to take calomel combined with opium, with a view to bring the system under the influence of mercury. This was accomplished, but the pain remained unabated, and there was no improvement as to the paralysis. On the 8th of September, for the first time, a fulness was observed in the left loin, the most prominent point being opposite the lowest dorsal and first lumbar vertebræ.

From this time there was no material change

in the local symptoms, except the addition of some spasmodic twitches of the muscles of the legs. But the powers of the patient were gradually giving way. He lost flesh, had no appetite for food, was affected with perspirations at night, and the pulse became more and more frequent. On the 16th of December he died.

The body was examined by Mr. Tatum.

A tumour, of the size of a man's fist, was found attached to the bodies of the three superior lumbar vertebræ on the left side, from whence it projected backwards, producing the enlargement, which had been perceptible during life, in the left loin. The tumour was lobulated, of a brown colour, and presented, when cut into, the usual appearance of medullary or fungous disease. The body of the second lumbar vertebra had entirely disappeared, but the intervertebral cartilages remained entire, the space between them being occupied by a process of the morbid growth. The bodies of the second and third lumbar vertebræ were partially absorbed on the left side. Those of the two or three inferior dorsal vertebræ, and the superior lumbar vertebræ were soft, so that they could be cut by the knife; and portions of medullary disease, similar in structure to the principal tumour, were found here and there deposited in the cancellous structure. The principal tumour had extended posteriorly and laterally, but externally to the dura mater, so as to compress the *cauda equina*, and completely to obliterate the second

pair of the lumbar nerves. The lower extremity of the spinal chord seemed to be softer than natural, but was not otherwise diseased. There was no appearance of disease in any other part of the body.

The following case is one of much interest in itself; and may not improperly be introduced in this place, as it is one of those which might by a careless observer be readily mistaken for a case of caries of the spine. It confirms a remark which I formerly made as to the operation of disease affecting the cervical portion of the spinal chord in producing paralysis of the upper extremities in the first instance, and of the lower extremities afterwards.

CASE LXXVI.

A young man, about twenty years of age, in January, 1829, after leading a very irregular life, and after having been much exposed to wet and cold in hunting, was suddenly seized with a violent pain in the neck, followed by considerable swelling. The swelling was situated chiefly on the right side, extending from the head to the shoulder. The patient at first paid little attention to his complaint, living in the same careless way as before with regard to both diet and

exercise: but in spite of this neglect, in a short time the pain and swelling in a great degree, but not wholly, subsided.

In the beginning of the following April, the upper extremity of the right side became affected with paralysis. Afterwards the left upper extremity, to a great extent, became paralytic also. In this state he remained, no active remedies having been adopted for his relief until he came under my care in the beginning of June.

At this time he complained of some degree of pain in the back of the head and neck: and he found it difficult to move the head from one side to the other. An enlargement and induration of the soft parts of the neck were still perceptible in the situation of the original swelling. There was complete paralysis of the muscles of the right arm, forearm, and hand: those of the opposite limb were also paralytic, but some of them were still capable of acting feebly, so that he could take hold of the right hand with the left, and move it from one position to another. The muscles of the lower limbs were feeble, but were capable, nevertheless, of supporting the body in the erect posture.

The bowels were very torpid, and the evacuation of a dark colour, a good deal resembling tar in appearance.

The urine was slightly alkaline, but voided without difficulty.

Leeches were applied to the neck, and afterwards a seton was introduced. Mercury was

given so as slightly to affect the gums. No amendment, however, followed the use of these remedies. The lower limbs became paralytic; and on the 19th of June the patient died, having been for a short time previously in a state of coma.

On examining the body after death, the ventricles of the brain were found to contain about two ounces of watery fluid. The brain itself was of an unusually soft consistence.

The cervical portion of the spinal chord was also softer than natural.

A quantity of soft solid substance, of a grey colour, apparently lymph, which had become organised, was found situated between the dura mater and the bodies of the vertebræ, occupying the whole of the anterior and a portion of the posterior part of the vertebral canal, and extending, from the occiput downwards, as low as the fourth cervical vertebra.

A substance similar to that which was found on the inside of the vertebral canal was also found lying on the fore part of the bodies of the cervical vertebræ, extending over the oblique and transverse processes, and communicating with the internal mass by processes extending through the spaces in which the nerves are situated, and surrounding the nerves themselves. The external mass was much larger than the internal, being not only thicker but extending lower down in the neck. In some parts it was not less than an inch in thickness;

in other parts it was thinner, and, altogether, it was of a very irregular shape.

There can be little doubt that, in this case, the original disease was inflammation of the cellular texture in connection with the cervical vertebræ and theca vertebralis; and from its having immediately followed exposure to wet and cold, we may also regard it as having been of rheumatic origin. In the following case, the patient seems to have laboured under a similar disease, having, however, a chronic form, and a more favourable termination.

CASE LXXVII.

May, 1838, a gentleman, forty years of age, consulted me under the following circumstances:—

He had severe pain in the back of the neck and head, and in the side of the neck also, as low as the shoulders. The neck was stiff, and the whole of the soft parts were rigid, the head admitting of scarcely the smallest motion. There were also pains and numbness of the upper extremities as low as the hands, but no loss of the power of motion. In other respects his health was not materially affected. His pulse was natural, and his appetite good, but his bowels were confined. He brought me the following statement from Mr. Sedgwick, of Boroughbridge, by whom he had been recommended to my care:—

“ Mr. ——— has been subject for many years to attacks of dyspepsia, of rheumatism, and nervous pains. The pain and rigidity of the neck began three years ago, having been preceded by rheumatism of the intercostal muscles, apparently induced by sleeping in a damp bed. He has also had severe falls from his horse in hunting.”

I prescribed for him a draught containing 3 grains of the iodide of potassium to be taken three times daily: and 2 grains of calomel with extract of hemlock to be taken every night at bed-time.

Under this plan of treatment a manifest improvement took place; and when he left my care, at the expiration of three weeks, he was free from pain, and had regained considerable power of moving the head. Mr. Sedgwick has lately been so kind as to furnish me with the following further information respecting him: “ Mr. ——— is quite well, with the exception of a slight rigidity of the neck, probably occasioned by a deposit of lymph. He continued gradually to improve under the plan which you recommended, which was continued for some time, and I do not remember that he had another bad symptom.”*

* I have met with several cases in young persons of an acute inflammatory disease affecting the neck, and bearing considerable resemblance to those described above.

In one case the first symptom was a violent attack of pain, induced while the patient (a little boy) was making a sudden exertion in playing with his brothers. In others the disease supervened on scarlet fever, measles, or simple continued

Neuralgic affections of the spine have been, and indeed still are, frequently mistaken for caries. The diagnosis of such cases is of the greatest practical importance. I do not, however, feel it necessary in this place to do more than advert to what I have already said on the subject of neuralgia of the joints in a former chapter.

fever. In all of them, after the inflammation had subsided, the neck was left rigid and immoveable, and inclined to one side ; so, that in some instances the cheek has almost rested on the shoulder. This may be attributed partly to the inflammation having been greater on one side than on the other, partly to the position which the patient has assumed, lying on one side in bed. The distortion has been sometimes so great as to give rise to a suspicion that some of the vertebræ were actually dislocated. If the disease be treated by leeches, purgatives, and the exhibition of mercury in the first instance, the inflammation is speedily subdued, and the neck restored to its natural figure. Otherwise, after the inflammation has subsided, a course of vapour baths and shampooing, combined with the wearing an apparatus for the purpose of supporting and gradually elevating the head, will be required for the relief of the distortion. If the employment of these remedies be long delayed, more or less of distortion will remain through life.

When the distortion is permanent, a lateral curvature of the whole spine is the necessary consequence. Nor is this all. A remarkable change is ultimately produced in the form of face, so that the forehead, eye, cheek, and jaw on one side are on a different level from the corresponding parts of the opposite side.

CHAP. XIII.

ON SOME DISEASES OF THE JOINTS NOT INCLUDED
UNDER THE FOREGOING HEADS.

1. It may be laid down as a general rule, that when any organ is attended by inflammation the disease is in the first instance limited to one of the textures of which that organ is composed, from which, however, it may extend gradually to the adjoining textures afterwards.

But this rule is not without its exceptions. As in a case of severe ophthalmia, the inflammation may at once affect the whole globe of the eye; so that it cannot be said that it begins in any one part more than in another; so it may be supposed that inflammation, when the cause of it (whatever that may be) exists in an intense degree, may affect simultaneously not only all textures belonging to a joint, but even those in the neighbourhood. I have every reason to believe that such cases have occurred under my observation in the living person; but it is only in one instance that I have had the opportunity of determining the correctness of this opinion by dissection.

CASE LXXVIII.

A gentleman, about twenty-five years of age, had laboured for several years under a disease of the brain, in consequence of which he had been in a state of complete helplessness and imbecility. In the summer of 1820 he became indisposed otherwise: there was a cluster of enlarged glands in the left groin, and a purulent sediment was deposited by the urine. I was now desired to see him in consultation with the late Dr. Maton, who was his ordinary medical attendant. Soon afterwards it was observed that there was a general tumefaction of the left thigh and nates; and the patient complained of pain on certain motions of the limb. Under the treatment employed the tumefaction subsided; but immediately afterwards a violent attack of diarrhœa took place, under which he sank, and died on the 29th of July.

On examining the body, we discovered an abscess, which seemed to have its origin in the cellular membrane of the pelvis, near the neck of the bladder, which had burst into the neighbouring portion of the urethra, and which had also extended forwards on the left side, so that it could be traced as high as the mass of enlarged glands in the groin.

The whole of the muscles surrounding the left hip-joint were preternaturally soft and vascular, and so altered from their natural condition that

they could be lacerated by the slightest force. They also were to a considerable extent detached or separated from each other, apparently in consequence of a serous fluid which had been effused between them, but of which nearly the whole had become absorbed. The capsular ligament and synovial membrane of the joint were of a red colour and unusually vascular; and the cartilages covering the head of the femur and lining the acetabulum were also red, and of a soft consistence, giving to the fingers a sensation somewhat similar to that which is produced by touching velvet.

The treatment of such cases is sufficiently obvious. The pain induced by any attempt at locomotion will do all that is required to keep the limb in a state of rest; and the surgeon will have to exercise his judgment in the employment of what are called antiphlogistic remedies,—blood-letting, purgatives, mercurial and diaphoretic medicines, and afterwards blisters.

2. In persons advanced in life absorption of the articular cartilages not unfrequently takes place by a peculiar process, different from any of those which have been formerly. It is sometimes preceded by a fibrous degeneration of the cartilage, while at other times there seems to be simply a wasting of the cartilage, as if it were from defective nutrition, the portion which remains retaining its natural structure and its na-

tural adhesion to the bone. There are no signs of inflammation either during life, nor perceptible on dissection afterwards. The patient never complains of pain, nor does suppuration follow. These changes are often discovered after death, when their existence had never been suspected previously. At other times they produce, in the motions of the limb, a grating sensation, corresponding to but less distinct than the grating which is perceptible after a fracture.

3. The absorption of the cartilage, which has been just described, is not however the only cause of grating or crackling produced by the motion of the joints. This symptom is sometimes manifestly connected with inflammation of the synovial membrane; at other times it occurs, as far as we can see, independently of any other disease, and it is then difficult to offer a reasonable explanation of it. The following case will serve to illustrate this last observation.

CASE LXXIX.

A married lady, apparently not more than twenty-six or twenty-seven years of age, in October, 1834, having been then a good deal weakened in consequence of her having suckled her infant for eleven months, observed a grating or crackling to be produced by certain motions of the left knee. This was not preceded by either pain or swelling, and neither pain nor swelling followed. Blisters were applied by the

surgeon who attended her, but with no other result than a sensation of weakness in the limb, so that the patient could scarcely walk. After three or four months she had so far recovered from the debilitating effects of the blisters as to be able to walk; but the crackling of the joint was undiminished.

When I saw her in August, 1835, she was still free from pain; the knee had its natural size and shape, and the only remaining symptom was, that when the leg was extended on the thigh a grating and crackling could be felt and heard distinctly. This was especially observed on walking up stairs.

Such cases are not very uncommon, and they occur especially among young women who have a disposition to hysteria. As far as I know they never have any unfavourable termination.

There are some very rare cases in which a peculiar crackling sound is produced during the action of the muscles. The sound is sometimes distinctly to be heard even at a considerable distance. It is difficult to offer any satisfactory explanation of this singular symptom. But the subject does not belong to our present inquiry, and I notice it merely that these cases may be distinguished from those of the crackling of the joints to which I have just referred.

4. We have abundant opportunities of observing that the joints of different individuals are

endowed with different degrees of mobility. This is often very evident in the articulations of the fingers with the metacarpal bones. We see one person whose fingers admit of being extended so as to be in a line with the bones by which they are supported, but of no further motion in this direction; and we see another in whom they are capable of being bent backwards, so that the nails may be brought almost in contact with the back of the hand. I suppose that this difference is to be attributed chiefly to the state of the ligaments by which the bones are united; and a corresponding looseness of the ligaments, but existing to a still greater extent, will explain the singular liability to dislocation which exists in some individuals.

CASE LXXX.

A gentleman consulted me in the year 1820 who had met with the accident of dislocation of the patella four times in the right and once in the left knee. The right shoulder had been twice completely dislocated; and there had been also a subluxation of that joint. The joint of the left thumb, with the *os trapezium*, had been dislocated several times. In every instance the dislocation had been reduced with the greatest facility, and generally without surgical assistance. The patient, at the time of my seeing him, was not more than twenty-three or twenty-four years of age, and was in perfect health,

except that he was subject to occasional severe head-aches, apparently connected with the state of his digestive organs. No peculiarity could be observed in the form or structure of his joints. His muscles were strong, and he was capable of much bodily exertion. He was accustomed to a good deal of walking exercise, but had not been particularly exposed to the ordinary mechanical causes of dislocation.

A similar looseness of the joints exists in some females disposed to hysteria, and is probably connected with the general weak state of the tissues, which makes them also liable to hæmorrhage from the lungs and mucous membranes without any organic disease.

CASE LXXXI.

January, 1843, I was consulted by an unmarried lady, twenty-six years of age, under the following circumstances.

When she lay flat on a sofa she could, by a certain muscular effort, produce a partial dislocation of the hip-joint, apparently bringing the head of the femur out of its natural position, so that it rested on the margin of the acetabulum.

When the muscular effort ceased, the bone returned to its proper situation.

She laboured under other symptoms, such as usually are referred to hysteria; and on inquiry I found that she had suffered from hysteria in various forms for many years. At one time

she was the subject of chorea, and then for a considerable time she had been affected with neuralgia of the back, and had been treated by a notorious charlatan as suffering from caries of the spine.

5. I may take this opportunity of noticing a circumstance, which is of some importance as connected with the diagnosis of disease of the hip-joint.

It occasionally happens that the two lower extremities are not of precisely the same length; and this may be the result of original formation, the femur and tibia of one side being respectively longer than those of the other side. If the whole of this difference amounts, as it sometimes does, to an inch, or an inch and a half, the individual is observed to limp in walking, and the great trochanter belonging to one limb is higher and more prominent than that of the other; and this sometimes leads a superficial observer to mistake the case for one of diseased hip. In such cases the necessary consequence is a lateral curvature of the spine, to a greater or less extent in proportion to the difference in the length of the two limbs; and in many instances, and more especially in girls, it is this alteration in the figure which first attracts the notice of the patient's friends.

In some instances a difference in the length of the two lower limbs is the result of disease. A limb which is affected with the paralysis to which children are liable, for the most part does

not keep pace in its growth with the sound limb. In some other cases the reverse of this happens, and the diseased limb actually becomes the longer of the two.

CASE LXXXII.

Master M. was brought to me from St. Petersburg for my opinion, in June 1832. I saw him in consultation with the late Dr. Lefevre, physician to the British embassy in that metropolis.

The cicatrices of three or four abscesses were seen in the skin on the anterior and upper part of the thigh, and there was considerable thickening of the deep-seated soft parts in the same situation, there being also a manifest adhesion of them to the bone. The appearance of the limb was such as would lead to the belief that there was a portion of diseased or dead bone of the femur, with probably some new bone formed round it; and that this had produced a succession of abscesses of the soft parts, as in ordinary cases of necrosis. The history of the case seemed to justify this opinion as to the nature of the disease.

Three years and a half ago the little boy had been suddenly seized with severe pain, which was referred to the knee, but only for a few hours, at the end of which time it shifted its place to the upper and anterior part of the thigh. The pain continued, and swelling immediately took

place. At the end of six months an abscess was opened, which, however, soon healed. Afterwards a second abscess formed, which was followed by others; but all of them had healed without any exfoliation having hitherto taken place.

There was some degree of stiffness of the hip-joint, but no more than might be reasonably attributed to the thickening and swelling of the soft parts in the neighbourhood. But the most remarkable circumstance in the case was, that the diseased thigh-bone, when measured from the anterior superior spinous process of the ilium to the patella, was found to be at least an inch and a quarter longer than that of the sound limb. The measurement was made repeatedly and with the greatest care, so that there could be no mistake respecting it. There was no perceptible difference in the length of the bones of the two legs.

In consequence of one limb being thus longer than the other, when the patient stood erect, with the soles of his feet planted on the ground, the great trochanter on the side of the disease appeared to project unnaturally, and this occasioned a manifest alteration in the form of the nates, somewhat corresponding to what is observed in the less advanced stage of disease of the hip-joint. That this appearance of the nates was to be attributed solely to the difference in the length of the two limbs, was proved by this circumstance, that it was at once removed by

placing a book an inch and a quarter in thickness under the foot of the sound limb, so as to raise that side of the pelvis to the same level with the other.

CASE LXXXIII.

August 30, 1839, I was consulted, concerning a young man seventeen or eighteen years of age, under the following circumstances.

There was a sinus having an external opening on the outside of one thigh, a little above the middle, apparently extending towards the base of the great trochanter. The thigh-bone of the same side, when carefully measured from the anterior superior spinous process of the ilium to the patella, was found to be three-fourths of an inch longer than that of the opposite side. There were no signs of other disease. *The hip-joint was moveable in every direction, and free from pain.

Some years ago the patient had had an attack of inflammation of the femur, which seemed to have terminated in necrosis. No exfoliation had ever taken place, but an abscess had formed, and there had been occasional attacks of inflammation, pain, and swelling, whenever the matter did not readily escape.

It is well known that in advanced life it not

unfrequently happens that the neck of the femur becomes shortened by means of a process which has been described under the name of interstitial absorption. Where this change occurs it is certainly, under ordinary circumstances, not confined to one femur; so that, although the limbs are shortened, there is still no difference in them as to length. Mr. Gulliver has, however, published some cases which have led him to the conclusion that such a shortening of the neck of the femur sometimes exists on one side and not on the other. It appears to me that the subject requires further investigation. But Mr. Gulliver's observations are of much interest, and at present I have only to refer to his papers on the subject in the forty-sixth volume of the *Edinburgh Medical and Surgical Journal*.

6. The circumstances of the following case seem to be best explained by supposing that there was disease of the sacro-iliac articulation corresponding to what I have regarded as rheumatic caries of the spine. Such disease is either of very rare occurrence, or has been much overlooked by others as well as myself.

CASE LXXXIV.

June 15th, 1848, a married lady, about forty years of age, consulted me under the following circumstances.

She was unable to walk without the aid of crutches.

She complained of pain after taking exercise, referred to the right sacro-iliac articulation and the right groin, but did not experience any severe pain otherwise.

The hip-joint admitted of complete motion in every direction without pain, and presented no signs of disease.

When the patient was placed in the supine posture, with the two limbs parallel to each other, the space between the anterior superior spinous process of the ilium and the patella on the right side we found to be two inches less than that on the left side. On further examination, with a view to determine the immediate cause of the shortening of the limb, I discovered a remarkable projection in the situation of the right sacro-iliac articulation, as if the ilium had been displaced and drawn upwards, of course drawing the hip-joint upwards with it. I could discover no other explanation of the apparent alteration in the length of the limb, nor had any other presented itself to the surgeons who had seen the patient previously,—Mr. Poyser of Wirksworth, who was her general medical attendant, and Mr. Hodgson of Birmingham, whose opinion had been asked in consultation.

The former of these gentlemen gave me the following account of the previous history of the case.

“Fourteen years ago Mrs. — began to

suffer from what was regarded as sciatica, which for several years recurred in the winter, and subsided during the warm weather of summer. Four years ago, during her first pregnancy, she suffered pain, which was referred to the hip, and for three months before her confinement she was quite unable to walk. In about three months after her confinement she was again able to walk, but with difficulty and pain. She was again confined in February 1846, and since then has never been able to walk without crutches. In the interval between her two confinements, she underwent a course of what is called the hydropathic treatment. After the birth of her second child she was advised to ride on a donkey, which however brought on so much pain that she was compelled to be laid up altogether, and have recourse to leeches. Afterwards an issue was made with caustic, and kept open for a considerable time, with some apparent relief."

I proposed for the patient a course of the bichloride of mercury with sarsaparilla, and that she should persevere in the system which had previously been begun under the direction of her former surgical attendants, of remaining in the recumbent posture on a sofa; and I am happy in being able to state, on the authority of Mr. Poyser, that she is now so far recovered as to be equal to the ordinary duties of life, though still labouring under the inconvenience of a shortened limb and a distorted pelvis. The medicines which I recommended were, I believe,

taken only for a limited period of time, and there is no doubt that her cure is mainly to be attributed to the long continuance of the state of perfect rest,—a circumstance which strongly confirms the opinion that the disease was analogous to that of caries of the spine, though affecting a different articulation.

CHAP. XIV.

ON INFLAMMATION OF THE SYNOVIAL BURSÆ.*

SECT. I.

History and Symptoms of this Disease.

INFLAMMATION of the synovial bursæ is marked by nearly the same characters, and (allowance being made for the difference of the parts with which they are connected) produces nearly the same results as inflammation of the synovial membranes of the joints. In the greater number of instances it occasions an increased secretion of synovia. In other cases the bursæ are distended by a somewhat turbid serum, with portions of coagulated lymph floating in it. Occasionally the disease terminates in the formation

* I include under this head the membranes forming the sheaths of tendons, which have the same structure, answer a similar purpose, and cannot with propriety be distinguished from other bursæ. I have adopted the term *synovial bursæ* instead of that which was in use formerly, as it expresses more accurately the structure and functions of the organ to which it is applied.

of abscess. Sometimes the membrane of the inflamed bursa becomes thickened, and converted into a gristly substance. I have seen it at least half an inch in thickness, with a small cellular cavity in the centre containing synovia. At other times, although the inflammation has continued for a very long period, the membrane of the bursa retains nearly its original structure.

Inflammation of a synovial bursa may be the consequence of pressure, or of other local injury. It may arise from the too great use of mercury, from rheumatism, or from some other constitutional affection; and, in such cases, it is frequently combined with inflammation of the synovial membranes of the joints. Sometimes it has the form of an acute, but more frequently it has that of a chronic inflammation.

The inflamed bursa forms a tumour, more or less distinct, according to its situation; more or less painful, according to the character of the inflammation. If the bursa be superficial, the fluctuation of fluid within it is, in the first instance, very perceptible; and under these circumstances, if the inflammation be considerable, it extends to the surrounding parts, and occasions a redness of the skin. When the disease has existed for some time, it generally happens that the fluid is less distinctly to be felt, on account of the membrane having become thickened; and where this alteration takes place to a great extent, the tumour exhibits all the

characters of a hard solid substance, of which the fluid contents are imperceptible.

When the inflammation is of long standing, it is not unusual to find, floating in the fluid of the bursa, a number of loose bodies of a flattened oval form, of a light brown colour, with smooth surfaces, resembling small melon seeds in appearance. There seems to be no doubt that these loose bodies have their origin in the coagulated lymph which was effused in the early stage of the disease; and I have had opportunities, by the examination of several cases, to trace the steps of their gradual formation. At first the coagulated lymph forms irregular masses of no determined shape, which afterwards, by the motion and pressure of the contiguous parts, are broken down into smaller portions. These, by degrees, become of a regular form, and assume a firmer consistence: and at last are converted into the flat oval bodies, which have just been described.

When inflammation of a synovial bursa ends in suppuration, the abscess sometimes makes its way directly to the surface of the skin, and bursts externally: but I suspect that, in other cases, the matter, in the first instance, escapes into the surrounding cellular membrane, and then it is liable to be confounded with those abscesses which originate in this texture. The following circumstances seem to warrant this opinion. There is no bursa more liable to be inflamed than that between the patella and the skin; and inflammation of it not unfrequently

terminates in suppuration, as I have ascertained to be the case, both by the discharge of pus, when the tumour has been punctured, and by dissection after death. It is very common to find a large abscess on the anterior part of the knee, which the patient describes as having begun over the centre of the patella in the situation of this bursa. The abscess has a somewhat peculiar character. It raises the skin from the patella, so that the latter cannot be felt; and from this point, as from a centre, it extends itself between the skin and the fascia, equally in every direction, covering the whole of the anterior part of the knee. A careless observer (judging from the general form of the tumour, and the fluctuation of fluid, without noticing the greater redness of the skin, and the circumstance of the fluid being over, instead of under, the patella,) might mistake the case for one of inflammation of the synovial membrane of the joint itself. Such an abscess must be supposed to commence either in the bursa above mentioned, or in the cellular texture. The original situation of the disease corresponds to that of the bursa: there appears to be no reason why an abscess of the cellular texture should occur in this precise spot more frequently than elsewhere; and hence it is reasonable to conclude, that the bursa is the part in which the abscess begins. It is not improbable that some other abscesses of the extremities may have a similar origin. The tumour which

occurs in the inside of the ball of the great toe, and which is one of those to which the name of bunion has been applied, occasionally suppurates; and I have found, on dissection, that this is formed by an inflammation of the bursa, which is here situated.

It frequently happens, after the inflammation has entirely subsided, that the disposition to secrete a preternatural quantity of fluid still remains, and that a dropsy of the bursa is the consequence; in like manner as hydrocele takes place in some cases, as a consequence of inflammation of the tunica vaginalis of the testicle.

In such cases the disease assumes various forms, according to the situation of the affected bursa, and its connection with the parts in the neighbourhood. To describe the whole of these would be an almost endless, and indeed an unnecessary, undertaking; and a few examples will sufficiently illustrate those points, with which it is most important that the surgeon should be acquainted.

Enlargement of a superficial bursa is always easily recognised. The tumour formed by the bursa, between the patella and the skin, when distended with lymph or serum, can be mistaken for no other disease. At first the parietes of it are thin, and the fluctuation of fluid is distinctly perceptible in it. But when the disease is of long duration, the thickening of the membrane of the bursa gives the disease all the character of a solid tumour. In one case having

attained the size of a small orange, the bursa was removed by an operation. The parietes of it were found to be half an inch in thickness, and of a fibrous structure, while the interior retained its cellular character, and contained a serous fluid.

A tumour formed by a distended bursa is of very frequent occurrence in the popliteal space. It is probably that belonging to the tendon of the *semi-membranosus* muscle. When the leg is extended, the tumour is tense and prominent; but when the leg is bent it recedes so as to be scarcely perceptible. In many instances it exists in combination with inflammation of the synovial membrane of the knee; and as the cavity of the bursa in some instances communicates with that of the joint, the extension of disease from one part to the other is easily explained.

When the disease affects the synovial membrane belonging to the tendons of the flexor muscles of the fingers, it forms a tumour in the palm of the hand, and another in the anterior part of the carpal extremity of the fore-arm, separated from each other by the annular ligament of the wrist; communicating, however, beneath it, so that the pressure which diminishes the size of one tumour increases that of the other.

The most perplexing cases to the surgeon are those in which there is disease of the deep-seated bursæ in the neighbourhood of the hip and shoulder. An obscure pain in the vicinity of the joint, and (in the shoulder especially) a crack-

ling sensation, perceptible to the hand, produced by the motions of the limb, combined with a difficulty in explaining the symptoms otherwise, may justify the suspicion that these bursæ are inflamed and swollen; but the large mass of muscles by which both these joints are protected renders it impossible to form any certain diagnosis, except in a few cases in which the bursal tumour is of sufficient size to present itself externally. A large swelling, formed by a cyst containing serum only, or serum with flakes of lymph floating in it, is occasionally met with protruding from under the inferior edge of the *trapezius* muscle; which may be traced to the immediate vicinity of the shoulder joint, and which seems to have its origin in one of the bursæ belonging to the muscles inserted into the large tuberosity at the head of the humerus. I have known a similar tumour to protrude from under the edge of the *glutæus maximus* muscle, containing between one and two pints of serum, and which seemed to have a similar origin near the joint of the hip. Bursal tumours of the hip are also found making their appearance on the outside, or on the forepart, of the joint, having made their way outwards through the interstices of the muscles. So, in other situations, similar tumours often shew themselves at a distance from the part in which the disease began.

Bursal tumours rarely cause any serious inconvenience, except from their bulk and from their mechanically interfering with the functions

of the parts in which they are situated. Occasionally, however, they suppurate, producing abscesses which are difficult to heal in consequence of the purulent contents not readily escaping, and burrowing among the neighbouring textures. Here, as in other cases, the cyst in some instances becomes gradually converted into a thick fibrous mass, so as to form a solid body with a small central cavity. In the case of the large cyst, which has been mentioned as protruding from under the edge of the *glutæus maximus*, I had the opportunity of watching its progress during several successive years. At first the membrane of the cyst was thin, so that the fluctuation of the fluid which it contained was as distinct as possible; but, gradually masses of solid matter were deposited in it, which gave it, in certain parts, an almost cartilaginous consistence.

SECT. II.

Treatment of this Disease.

THE treatment of inflammation of the synovial bursæ is to be conducted on the same principle as that of inflammation of the synovial membranes of joints. For the most part the inflammation may thus be easily relieved; and if the proper remedies be had recourse to in the early stage of the disease, the fluid which has been effused become absorbed.

I have stated that when the disease has been long established, the preternatural secretion of fluid will often continue after the inflammation has entirely subsided. Under these circumstances, a blister may be applied and kept open with the savine cerate, the part being at the same time supported by a splint or bandages, so as to limit its motion, or rather so as to keep it in a state of absolute immobility. This treatment will often be attended with a very good result; but the cure is always tedious, occupying a period of many months.

Where the loose bodies, which have been described in the last section, are found in the cavity of the bursa, these may in themselves be sufficient to keep up the formation of fluid.

Under these circumstances, the first step towards a cure is to puncture the bursa, so as to allow these loose bodies to escape.

But this operation, simple as it appears to be, is always (except where the bursa is unconnected with tendons, and at the same time superficially situated, as in the instance of the bursa over the patella), to be performed with the greatest caution. The suppuration of a bursa, under any other circumstances, may be productive of very serious inconvenience, if not of actual mischief, and should not be artificially induced. The tumour may at all times be punctured with a needle, so as to ascertain the nature of the fluid which it contains, and this is sometimes necessary with a view to a more accurate diagnosis. If it be thought expedient to make a larger opening, all undue pressure and rude manipulation should be carefully avoided, and means should be employed for keeping the parts in a state of complete repose afterwards. If these precautions be neglected, active inflammation may ensue, terminating in extensive suppuration, and producing great constitutional disturbance. I know more than one instance in which the death of the patient was the ultimate result of such an operation incautiously performed.

The only exceptions to the rule which has been just laid down, are where the bursa is superficially situated, and unconnected with tendons or the neighbouring joint. In the case of the

bursa in front of the patella, I have not unfrequently succeeded in making a cure by laying it open, and dressing the cavity with lint, or by passing a few threads through it in the manner of a seton. A good deal of inflammation has often followed even this operation, but it has never been productive of any further ill consequences. Of course such a mode of treatment ought not to be adopted without confining the patient to a bed or sofa, and preventing the motion of the limb by means of a splint.

When the coats of the bursa have become very much thickened and altered in structure, I am not aware that there is any method by which they can be restored to their natural condition. But if the diseased bursa be situated superficially, it may be removed with as much facility as an encysted tumour. I have never, indeed, performed this operation myself, nor have I heard of it being done by others, except (as in a case already mentioned,) on the bursa of the patella; but there can be no doubt that there are some other superficial bursæ to which it would be equally applicable if occasion called for it. I may take this opportunity of mentioning a case which shows with what facility a bursa which has been removed may be replaced by a new one. A girl, seventeen years of age, had a diseased bursa over the patella, which was removed by the late Mr. Rose, in St. George's hospital. In less than a

year afterwards she was re-admitted under my care, with a similar tumour, of considerable size. I made a free incision into it with a lancet. A considerable quantity of lymph and serum escaped. The inner surface of the cyst suppurated and healed, and the patient soon afterwards left the hospital cured.

THE END.



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